

CV Rockwell Hardness Tester W-600A / W-600MA / W-600MA/S

Basic regular Rockwell type tester (600A/MA) and Superficial Rockwell type tester (600MA/S) offering accuracy, reliability and durability at an extremely affordable price.



W-600A



W-600MA



W-600MAS

Features

- Rugged construction, will stand up to the harshest environments
- Direct reading of Rockwell scales HRC, B, A, F or Superficial: HRT, HRN
- Other scales with the use of optional indenters
- Accuracy conforms to EN-ISO 6508 and ASTM E-18
- Easy load force selection by robust dial knob
- Oil brake with variable damping by adjustable knob (W-600A)
- Large capacity to accommodate large test specimen
- Electronic control of load duration (dwell time) (W-600MA & W-600MA/S)
- Motorised testing procedure (W-600MA & W-600MA/S)
- Standard delivery including accessories ready for testing all scales

CV Rockwell Hardness Tester W-600A / W-600MA / W-600MA/S



TECHNICAL SPECIFICATION

Rockwell scales	A, B, C, F (W-600A/W-600MA)
Standard	A, B, C, F (W-600A/W-600MA)
Superficial	HRT, HRN (W-600MA/S)*
Hardness resolution	1 of a Rockwell unit
Test loads	
Rockwell	10kgf preload / 60, 100, 150kgf main load
Superficial Rockwell	3kgf preload / 15, 30, 45kgf main load
Display	Dial indicator
Test force application	By force lever (W-600A) Motorised load system (W-600MA & W-600MA/S)
Test cycle	Manual (W-600A); Motorised (preload applied manually) (W-600MA & W-600MA/S)
Load duration	Manually, following display indication (W-600A), Automatic (W-600MA & W-600MA/S)
Dwell time	2-99 sec (1 sec. step) (600MA/S)
Data output	Non
Accuracy	Conforms to EN-ISO 6508 and ASTM E-18
Specimen accommodation	Vertical space 170mm (6.7") Horizontal space (from center-line) 165mm (6.5")
Specimen access	External surfaces
Power supply	Non (600A), 220V 50Hz (600MA & 600MA/S)
Machine dimensions	150mm x 485mm x 700mm (WxDxH)
Machine weight	Approx. 85kg

*Other scales with the use of optional indenters.

CV ROCKWELL ANALOGUE HARDNESS TESTER

Code No	Description
W-600A	Rockwell Tester, Manual, Analogue display
W-600MA	Rockwell Tester, Motorised, Analogue display
W-600MAS	Superficial Rockwell Tester, Motorised, Analogue display

Standard Delivery

- Main unit
- Diamond Rockwell indenter
- Rockwell ball indenter 1/16"
- Hardness test block $\pm 60\text{HRC}$
- Hardness test block $\pm 25\text{HRC}$
- Hardness test block $\pm 85\text{HRB}$
- Flat anvil $\phi 60\text{mm}$
- Large flat anvil $\phi 150\text{mm}$
- V-anvil $\phi 40\text{mm}$
- Adjustable feet (4 pcs)
- Spindle protection cover
- Solid accessories case
- CV Instruments certificate
- Installation & user manual
- Spare lamps 6V-12W (2pcs) (W-600MA/S)
- Spare balls 1/16" (5pcs)
- Power cable (W-600MA/S)
- Fuse 0.5A (2pcs) (W-600MA/S)

Optional Accessories

- Certified test blocks
- Certified indenters & balls
- Clamping protection nose
- Pedestal spot anvil $\phi 10\text{mm}$

CV Advanced Digital Rockwell Hardness Tester W-600BDL / W-600MBDL / W-600MBDL/S

Basic digital regular Rockwell type tester (W-600BDL/MBDL) and Superficial Rockwell type tester (W-600MBDL/S) offering accuracy, reliability and durability at an extremely affordable price.



W-600BDL



W-600MBDL



W-600MBDL/S

Features

- Advanced functions such as CONVERSION to Brinell, Vickers and all Rockwell scales. USB-2 output, printer output for detailed measuring report, Go/No Go limit settings, 99 memory positions, PROGRAM mode stores 50 test program settings, shape correction setting, full statistics
- Direct reading of Rockwell scales HRA, B, C, D, E, F, G, K, L, M, P, R, S (HRN, T, W, X & Y W-600MBDL/S)
- Accuracy conforms to EN-ISO 6508 and ASTM E-18
- Easy load force selection by robust dial knob
- Oil brake with variable damping by adjustable knob (W-600BDL)
- Large capacity to accommodate large test specimen
- Selectable control of load duration (dwell time)
- Motorised testing procedure (W-600MBDL & W-600MBDL/S)
- Rugged construction, will stand up to the harshest environments
- Standard delivery including accessories ready for testing all scales

CV Advanced Digital Rockwell Hardness Tester W-600BDL / W-600MBDL / W-600MBDL/S



TECHNICAL SPECIFICATION

Rockwell scales	
Standard	A, B, C, D, E, F, G, K, L, M, P, R, S
Superficial	HRN, T, W, X & Y (W-600MBDL/S)
Hardness resolution	0.01 of a Rockwell unit
Test loads	
Rockwell	10kgf preload /60, 100, 150kgf main load
Superficial Rockwell	3kgf preload /15, 30, 45kgf main load
Display	Full colour multi function indicator
Test force application	By force lever (W-600BDL) Motorised load system (W-600MBDL)
Test cycle	Manual (W-600BDL); Motorised (preload applied manually) (W-600MBDL)
Load duration	Manually, following display indication (W-600BDL); Automatic (W-600MBDL)
Dwell time	2-99 sec. (1 sec. step)
Measuring protocol	ISO / ASTM / JIS
Indications on display	Progress bar for preload, preload applied, main load applied, dwell time, invalid reading, invalid measurement, invalid procedure, Rockwell value, Go/No Go, shape correction, limits, program number, conversion scale, statistics, scale applied
Accuracy	Conforms to EN-ISO 6508 and ASTM E-18
Specimen accommodation	Vertical space 170mm (6.7") Horizontal space (from center-line) 165mm (6.5")
Specimen access	External surfaces Cylindrical surfaces down to 3mm diameter
Data output	USB
Power supply	Input 110/220Volt 50/60Hz
Machine dimensions	150mm x 485mm x 700mm (WxDxH)
Machine weight	Approx. 85kg

Standard Delivery

- Diamond Rockwell indenter
- Rockwell ball indenter 1/16"
- Hardness test block ±60HRC
- Hardness test block ±25HRC
- Hardness test block ±85HRB
- Spare balls 1/16" (5 pcs)
- Flat anvil ø60mm
- Testing table large ø150mm
- V-anvil ø40mm
- Power cable
- Adjustable feet (4 pcs)
- Spindle protection cover
- Spare lamps 6V-12W (2pcs)
- Solid accessories case
- CV Instruments certificate
- Installation & user manual

Optional Accessories

- Reference hardness blocks
- Certified indenters & balls
- Clamping protection nose
- Pedestal spot anvil Ø10mm

CV ROCKWELL DIGITAL HARDNESS TESTERS

Code No	Description
W-600BDL	Rockwell Tester, Manual, LED display
W-600MBDL	Rockwell Tester, Motorised, LED display
W-600MBDL/S	Superficial Rockwell Tester, Motorised, LED display

Eseway® Premium Rockwell Hardness Tester EW-650

LCD touch screen, superior functionality, ultra high precision, 3 models available.

Features

- Measures all standard Rockwell hardness values
- Simultaneous conversion to HV, HB and other HR scales
- Rugged fine cast frame, allowing larger dimension work pieces
- ASTM, ISO, JIS compliant
- ESELOAD™ unique motorised load application system, auto selection of main loads depending on HR scale (656 & 657 only)
- Superior depth measuring system through Heidenhain (Germany) transducer
- ESETOUCH™ advanced LCD touch screen & operator panel with user friendly menu operation in multiple languages
- High speed preload, loading and unloading procedure for ultra high efficiency
- ESELIFT™ (657 only) motorised elevating screw simplifies and speeds up test operation
- Automatic measurement procedure, load / dwell / unload (655 & 656 models)
- ESEMATIC™ fully automatic positioning and measuring procedure (positioning, preload, load, dwell, unload (657 only))
- Storage of 50 test programs and tester settings, allowing you to set up your tester in just seconds
- Alpha numerical data entry
- Continuous automatic "online" statistics, incl. average of readings etc.
- Storage of 99 single hardness values
- Go / No Go mode
- Convex and concave measuring mode
- Calibration date expired (reminder)
- Service mode including electronic linearity calibration, tests counter, maintenance system
- Prints statistics to built-in printer or external printer
- Connects with PC or SPC network via built-in bi-directional USB2 connector



Standard Delivery

- Main unit
- Built-in thermal printer
- Data-output USB2
- Diamond Rockwell indenter
- Rockwell ball indenter 1/16"
- Rockwell testing balls
- Flat testing anvil Ø 60mm
- Flat anvil Ø 150mm
- V-anvil Ø 50mm
- Hardness test blocks:
±60 HRC, ±25 HRC, ±85 HRB
- Power cable
- Spare fuse
- Adjustable feet (4 Pcs)
- Spindle protection cover
- Machine cover
- Solid accessories case
- ESEWAY® certificate
- User and installation manual

Optional Accessories

- Clamping and indenter protection nose
- UKAS, DKD, ASTM Certified test blocks
- UKAS, DKD, ASTM Indenters & balls
- Pedestal spot anvil Ø 10mm
- Special support systems for large work pieces

TECHNICAL SPECIFICATION

Rockwell scales	A, B, C, D, E, F, G, K, L, M, P, R, V
Conversion to	HV, HB, other HR scales
Hardness resolution	0.1 of a Rockwell unit
Pre-load	10kgf
Main loads	60, 100, 150kgf
Pre-load application	Manual (automatic for 657 ESEMATIC™)
Test load application	Fully automatic
Data entry	Membrane keypad
Test force application	Automatic main load application
Data output	Built in high speed printer & USB2
LCD Display	Hardness value, conversion value, test force indicator, dwell time, memory contents, all machine settings, go / no go, all statistics
Specimen accommodation	Vertical space 275mm Horizontal space (from centre of elevator) 190mm
Power supply	110/240V, 50-60Hz
Machine dimensions	Approx. 940mm x 390mm x 670mm (HxWxD)
Net weight	Approx. 140kg

ESEWAY® PREMIUM ROCKWELL TYPE HARDNESS TESTER

Code No	Description
W-EW-655	ESETOUCH Manual load, Manual elevator lead screw
W-EW-656	ESELOAD Automatic load selection, Manual elevator lead screw
W-EW-657	ESEMATIC Automatic load selection, motorised elevator lead screw / Full automatic

Eseway® Premium Twin Scale Rockwell Hardness Tester EW-670

LCD touch screen, superior functionality, ultra high precision, 3 models available.

Features

- Measures all Standard & Superficial Rockwell hardness values
- Simultaneous conversion to HV, HB and other HR scales
- Rugged fine cast frame allowing large dimension work pieces
- ASTM, ISO, JIS compliant
- ESELOAD™ unique motorised load application system, auto selection of main loads depending on HR scale (676 & 677 only)
- Superior depth measuring system through Heidenhain (Germany) transducer
- ESETOUCH™ advanced LCD touch screen & operator panel with user friendly menu operation in multiple languages
- High speed preload, loading and unloading procedure for ultra high efficiency
- ESELIFT™ (677 only) motorised elevating screw simplifies and speeds up test operation
- Automatic measurement procedure, load / dwell / unload (677 only)
- ESEMATIC™ fully automatic positioning and measuring procedure (positioning, preload, load, dwell, unload (676 and 677 models))
- Storage of 50 test programs and tester settings, allowing you to set up your tester in just seconds
- Alpha numerical data entry
- Continuous automatic "online" statistics, incl. average of readings etc.
- Storage of 99 single hardness values
- Go / No Go mode
- Convex and concave measuring mode
- Calibration date expired (reminder)
- Service mode including electronic linearity calibration, tests counter, maintenance system
- Prints statistics to built-in printer or external printer
- Connects with PC or SPC network via built-in bi-directional USB2 connector



Standard Delivery

- Main unit
- Built-in printer
- Data-output USB2
- Diamond Rockwell indenter
- Rockwell ball indenter 1/16"
- Rockwell testing balls
- Flat testing anvil ø 60mm
- Flat anvil ø 150mm
- V-anvil ø 50mm
- Hardness test blocks: ±60HRC, ±25HRC, ±85HRB, ±50HR30N, ±80HR30N, ±70HR30T
- Power cable
- Adjustable feet (4 Pcs)
- Spindle protection cover
- Machine cover
- Solid accessories case
- ESEWAY® certificate
- User and installation manual

Optional Accessories

- Clamping and indenter protection nose
- UKAS, DKD, ASTM Certified test blocks
- UKAS, DKD, ASTM Indenters & balls
- Pedestal spot anvil
- Special support systems for large work pieces

TECHNICAL SPECIFICATION

Rockwell scales	Standard Superficial	A, B, C, D, E, F, G, K, L, M, P, R, V 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y
Conversion to	HV, HB, other HR scales	
Hardness resolution	0.1 of a Rockwell unit	
Pre-load	3kgf / 10kgf	
Main loads	15, 30, 45, 60, 100, 150kgf	
Pre-load application	Manual (automatic for 677 ESEMATIC™)	
Test load application	Fully automatic	
Data output	Built-in high speed printer & USB2	
LCD Display	Hardness value, conversion value, test force indicator, dwell time, memory contents, all machine settings, go / no go, all statistics	
Specimen accommodation	Vertical space 275mm Horizontal space (from centre of elevator shaft) 190mm	
Power supply	110/240V, 50-60Hz	
Machine dimensions	Approx. 940mm x 390mm x 670mm (HxWxD)	
Net weight	Approx. 140kg	

ESEWAY® PREMIUM ROCKWELL TYPE HARDNESS TESTER

Code No	Description
W-EW-675	ESETOUCH Manual load, Manual elevator lead screw
W-EW-676	ESELOAD Automatic load selection, Manual elevator lead screw
W-EW-677	ESEMATIC Automatic load selection, Motorised elevator lead screw, full automatic

Load Cell Closed Loop Brinell Hardness Tester NEXUS 3000 Series

RS232

The advanced Load Cell, Force Feedback Closed Loop, load application system of the NEXUS 3000 allows a wide variety of test loads ranging from 30kgf to 3000kgf in one hardness test frame.



W-3001

Features

- Large multi function LCD display, Brinell microscope and built-in hardness calculator
- Shows Brinell hardness value directly on the display; converts to Rockwell, Vickers, Leeb's and tensile strength
- Test loads 30kgf - 3000kgf
- Innovaview Computer & CCD (USB camera) technology allows measurement of HB indents automatically and stores them in the system's database program, or export CSV files to Excel
- Motorised automatic elevator spindle available for easy work-piece positioning and running fully automatic test procedures; positioning, main load, dwell, unload. Automatic start sequence option (NEXUS 3001 XLM)
- Frame types:
 - Standard: vertical capacity - 220mm, throat depth - 220mm
 - XL: vertical capacity - 390mm, throat depth - 220mm

Load Cell Closed Loop Brinell Hardness Tester NEXUS 3000 Series



TECHNICAL SPECIFICATION

W-3001	30, 31.25, 62.5, 100, 125, 187.5, 250, 500, 1000, 1500, 3000Kgf (Brinell)
Test force selection	Electronic, closed loop, load cell, force feedback system, indication in kgf or N. Test force selectable over menu operation
Test procedure	Automatic, loading/dwell/unloading
Hardness value	5 digits
Loading speed	variable depending on load application
Test force accuracy	<1% full range
User display	Diameter of indent, Length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HB
Hardness conversion	Rockwell, Vickers, Brinell, Leeb & Tensile 2 scale simultaneously
Standardisation	EN ISO 6506, 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
Memory	Large memory for testing results
Data output	RS-232, Bi-Directional
Dwell time setting	Default 10 seconds, user defined 1 to 60 seconds
Eyepiece microscope	Analogue
Vertical capacity	Standard 220mm, optional 390mm
Horizontal capacity	220mm (from centre line)
Humidity	10% to 90% non condensing
Weight	130Kg, XL version 160Kg
Power	220V/110V, 50/60Hz, single phase

Standard Delivery

- Main unit
- Flat anvil 200mm
- Analogue microscope 20x (Brinell)
- Brinell test blocks & indenters
- RS232 data output
- 4 adjustable feet
- Fuse
- Installation & user manual
- Quality certificate
- Colour: laboratory white

Optional Accessories

- Motorised spindle
- Analogue microscope with LED light 30x, 40x, 100x
- HB100 Video measuring and database system
- Extended height/width frame
- Motorised X-Y stage
- Certified indenters & test blocks
- Indenters & test blocks for Brinell
- Solid tester table & storage cabinet
- Specify alternative colour of unit

NEXUS 3000 SERIES TESTER

Code No	Description
W-3001	Load Cell Closed Loop Brinell Hardness Tester

'King' Brinell Portable Hardness Tester

The 'King' Brinell Portable Hardness Tester is a lightweight, full load (3000kg) instrument capable of accurately testing a large variety of metal specimens. The testers portability allows it to be used in any plane, conventionally for full load (3000Kg), in-situ Brinell testing of large components.

Features

- Wide measuring range to 3000kgf
- Simple handling and low test expenditure
- High accuracy
- Conforms to ASTM and ISO Brinell Standards
- API approved

Standard Delivery

- Main unit
- 10mm Brinell ball
- Flat, dome and V-anvils

Optional Accessories

- Chain adapter
- Test blocks
- Reverse direction adapters
- Low pressure test head
- Video measurement microscope system



TECHNICAL SPECIFICATION

Pressure exerted	Up to 3000kgf
Pressure gauge indication	True load and load reached indication
Max specimen height	14", (20" optional model)
Max specimen depth	4", (6" optional model)
Brinell ball	Standard 10mm, optional 2.5mm, 5mm etc
Accuracy	0.5 of 1% of load ASTM/BS certifiable

BRINELL PORTABLE HARDNESS TESTER

Code No	Description
W-WHB-120	King Brinell Tester
W-WHB-MIC	20X Microscope for King Brinell

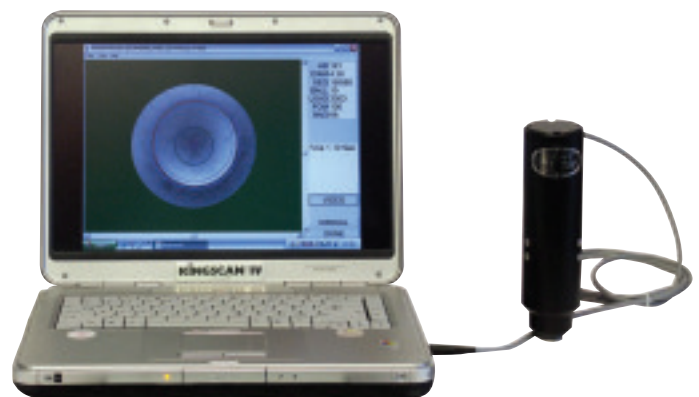
Kingscan IV Automatic Brinell Video Microscope

Features

- Major improvement in accuracy and repeatability of measurement
- Reduced cost of testing 2 sec test time typical
- 6ft and 15ft camera cables
- LED array lighting to maximise test accuracy under any condition
- Remote measure facility

BRINELL VIDEO MICROSCOPE

Code No	Description
W-WHB-KIIIK	KingScanIV Video Microscope System
W-WHB-PACK	KingScan/Case/Laptop
W-WHB-CASE	Case



'King' Brinell Portable Hardness Tester Accessories

- **Standard test head**

Calibrated accurate to 1/2 of 1% load.
Releases at 3000kg automatically.
Capable of incremental loads



- **Standard test head with long ram**

Same features as standard test head plus a long ram that puts impression head at end of 2" extension for easy access into recessed areas or over raised edges



- **Low pressure test head**

Applied load and indicator dial are coordinated for softer metals.
Can be calibrated to release at loads of 62-1/2kg, 125kg, 250kg, 500kg, or 1000kg



- **Low pressure test head with long ram**

Same features as low pressure test head plus a long ram that puts impression head at end of 2" extension for easy access into recessed areas or over raised edges



- **Adapter to hold test head upright without base**

For testing large flats it enables test heads to be used under large drill presses, boring mills, arbor presses and beams that are capable of withstanding 3000kg load



- **Chain adapter**

Used for large cylinders it fits onto a standard test head and wraps around specimens that are too big for regular tester. High strength chrome/molybdenum steel arms hold the chain to the test head and allow it to stay rigid while the chain takes the full thrust of the load. Supplied with 4' chain



- **Base**

14" base with 14" test height opening and 4" throat is standard. Optional 6" throat with either 14" or 20" test height opening available, 20" base also available with 4" throat and 20" test height opening



- **2.5mm and 5mm ball adapter**

Used on softer materials or where a smaller impression is desired



- **Stage micrometer**

Used to check calibration of Brinell Microscope by placing the microscope on the stage micrometer and aligning the grid on the stage micrometer with the grid on the microscope. If the grids do not match perfectly, the microscope is out of calibration and should be re-calibrated. Meets ASTM50, and is traceable to NIST standards



- **Brinell microscope**

Constructed from stainless steel, the rugged and optically reliable Brinell microscope is the most versatile on the market today. Featuring a 20x pre-focused lens, the microscope has a narrow nosepiece which easily fits into tight recesses, resulting in less grinding on castings, billets and dies. For added stability when performing flat work, a slip-on base adapter is included. A side opening in the microscope allows plenty of natural light for viewing, and a cordless movable pen light can be used in dim conditions. Calibrated on equipment traceable to NIST standards, the Brinell microscope meets ASTM 5-10 specifications. It is ready to use and comes equipped with a handy storage case



Premium Micro-Vickers Hardness Tester

NEXUS 410AAT/DAT Series

RS232

Motorised turret with analogue / digital measurement microscope and easy-to-use integrated hardness calculator.

Features

- Two models available with 10gf - 1 Kgf or 10gf - 2Kgf depending on model
- Fully automatic 4 position turret for Micro Vickers /Knoop measurements
 - Choice of turret configuration
 - 3 objectives and 1 indenter
 - 2 objectives and 2 indenter (Vickers & Knoop)
 - Dual indenter (Vickers/Knoop) turret optional
- High resolution eyepiece
- Built in high speed printer



NEXUS 410AAT/DAT SERIES TESTER

Code No	Description
W-412AAT	Analogue, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1Kgf (HV)
W-413AAT	Analogue, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1Kgf (HV)
W-412DAT	Digital, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1Kgf (HV)
W-413DAT	Digital, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1Kgf (HV)

TECHNICAL SPECIFICATION

Test force selection	Manual
Test procedure	Automatic, loading/dwell/unloading
Hardness value	5 digits
Turret	4 positions over 360°, fully automatic, memorised start position, option for 2
Test force accuracy	< +/-1% for force from 100gr to 2kg, < +/-1.5% for force below 100gr
User display	Length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HV, HK
Standardisation	EN, ISO 6507, ASTM E-384, EN ISO 4545
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
Firmware	English
Memory	Memory for 20 test results, with CCD-VIEW software unlimited results
Data output	RS-232 Bi-Directional
Dwell time setting	Default 5 seconds, user defined 1 to 60 seconds (5 sec. increments)
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, 30W, green filter, dimmable
Optical path	2 way, eyepiece / camera
Vertical capacity	90mm (maximum specimen height)
Horizontal capacity	120mm (from centre line)
Stage dimensions	100x100mm, travel 25x25mm, and reading 0.01mm
Operating temperature	5°C to 40°C (+/-20° for force 25gr and 50gr)
Humidity	10% to 90% non condensing
Dimensions	420 x 250 x 490mm
Weight	37.5Kg
Power	240V/110V, 50/60Hz, single phase

Standard Delivery

- Main unit
- Manual X-Y stage
- Objectives according to model (10x & 40x or 10x, 20x & 40x)
- Analogue eyepiece 15x (410AAT)
- Digital eyepiece 15x (410DAT)
- Vickers test block (+/- 725 HV 1)
- Vickers test block (+/- 450 HV 0.2)
- Built-in thermal printer
- RS-232 data output
- 4 adjustable feet
- Set of work piece fixtures - vice, chuck & clamp
- Spare halogen bulb
- Fuse
- Installation & user's manual
- Quality certificate

Optional Accessories

- Choice of objective configuration
- IMP Video measuring systems
- Dual indenter turret, Vickers & Knoop
- Motorised X-Y stage
- Motorised X-Y-Z stage (auto focus)
- Metal support table with storage cabinet
- Indenter & test blocks
- Certified indenter & test blocks

Optional System

- IMP system for semi and automatic traverses, pattern testing through PC support and motorised XY stage

Premium Micro-Vickers Hardness Tester

NEXUS 420AAT/DAT Series



Motorised turret with analogue / digital measurement microscope and easy-to-use integrated hardness calculator.

Features

- Two models available with 10gf - 1 Kgf or 10gf - 2Kgf depending on model
- Fully automatic 4 position turret for Micro Vickers /Knoop measurements
 - Choice of turret configuration
 - 3 objectives and 1 indenter
 - 2 objectives and 2 indenter (Vickers & Knoop)
 - Dual indenter (Vickers/Knoop) turret optional
- High resolution eyepiece
- Built in high speed printer



NEXUS 420AAT/DAT SERIES TESTER

Code No	Description
W-422AAT	Analogue, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2Kgf (HV)
W-423AAT	Analogue, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2Kgf (HV)
W-422DAT	Digital, 2 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2Kgf (HV)
W-423DAT	Digital, 3 objectives, 0.01 - 0.025 - 0.05 - 0.1 - 0.2 - 0.3 - 0.5 - 1 - 2Kgf (HV)

TECHNICAL SPECIFICATION

Test force selection	Manual
Test procedure	Automatic, loading/dwell/unloading
Hardness value	5 digits
Turret	4 positions over 360°, fully automatic, memorised start position, option for 2 indenters and 2 objectives or 1 indenter and 3 objectives
Test force accuracy	< +/-1% for force from 100gr to 2kg, < +/-1.5% for force below 100gr
User display	Length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HV, HK
Standardisation	EN, ISO 6507, ASTM E-384, EN ISO 4545
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
Firmware	English
Memory	Memory for 20 test results, with CCD-VIEW software unlimited results
Data output	RS-232 Bi-Directional
Dwell time setting	Default 5 seconds, user defined 1 to 60 seconds (5 sec. increments)
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, 30W, green filter, dimmable
Optical path	2 way, eyepiece / camera
Vertical capacity	90mm (maximum specimen height)
Horizontal capacity	120mm (from centre line)
Stage dimensions	100x100mm, travel 25x25mm, and reading 0.01mm
Operating temperature	5°C to 40°C (+/-20° for force 25gr and 50gr)
Humidity	10% to 90% non condensing
Dimensions	420 x 250 x 490mm
Weight	37.5Kg
Power	240V/110V, 50/60Hz, single phase

Standard Delivery

- Main unit
- Manual X-Y stage
- Objectives according to model (10x & 40x or 10x, 20x & 40x)
- Analogue eyepiece 15x (420AAT)
- Digital eyepiece 15x (420DAT)
- Vickers test block (+/- 725 HV 1)
- Vickers test block (+/- 450 HV 0.2)
- Built-in thermal printer
- RS-232 data output
- 4 adjustable feet
- Set of work piece fixtures - vice, chuck & clamp
- Spare halogen bulb
- Fuse
- Installation & user's manual
- Quality certificate

Optional Accessories

- Choice of objective configuration
- IMP Video measuring systems
- Dual indenter turret, Vickers & Knoop
- Motorised X-Y stage
- Motorised X-Y-Z stage (auto focus)
- Metal support table with storage cabinet
- Indenter & test blocks
- Certified indenter & test blocks

Optional System

- IMP system for semi and automatic traverses, pattern testing through PC support and motorised XY stage

Premium Closed Loop Micro/Macro Vickers, Knoop & Brinell Hardness Tester

NEXUS 4000 Series

RS232

High-end Vickers/Knoop/Brinell hardness testers with low and high forces ranging from HV0.01 to HV50. The NEXUS 4000 series features state of the art Closed Loop, Load Cell, and Force feedback technology for a reliable fast measurement procedure.

Features

STAGES:

- Manual X-Y stage
- Motorised X-Y stage
- Motorised X-Y-Z stage
- IMPRESSIONS Video Measuring System

TURRET SYSTEM:

- Fully automatic 4 position turret for Micro Vickers / Macro Vickers or Knoop measurements
- Featuring 3 objectives at choice, all 3 objectives can be used for measuring and observation

INDENTERS:

- Vickers 136°
- Knoop 172.5° x 130°
- Brinell 1 & 2.5mm

EYEPIECE:

- Electronic eyepiece microscope with precision encoder providing 15x magnification

OBJECTIVES:

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



Standard Delivery

- Main unit
- Manual X-Y stage
- Flat anvil 60mm
- Objectives 5x, 10x, 20x or 10x, 20x, 40x
- Digital eyepiece 15x
- Vickers test block (+/- 700 HV10)*
- Vickers test block (+/- 700 HV30)*
- Built in thermal printer
- RS232 data output
- 4 adjustable feet
- Spare halogen lamp
- Installation & user manual
- Quality certificate
- Set of work piece fixtures, vice, chuck, clamp

*May vary depending on model

Optional Accessories

- IMP video measuring system
- Motorised X-Y stage
- Motorised X-Y-Z stage
- Indenters & test blocks
- Certified indenters & test blocks
- Solid tester table & storage cabinet

NEXUS 4000 SERIES TESTER

Code No	Rockwell Scales	Load Range
W-4300	Vickers/Knoop	1Kgf - 30Kgf
W-4301	Brinell	1Kgf - 31.25Kgf
W-4302	Macro Vickers/Knoop	300gf - 30Kgf
W-4303	Micro/Macro Vickers/Knoop	20gf - 30Kgf
W-4304	Micro/Macro Vickers/Knoop/Brinell	20gf - 31.25Kgf
W-4305	Micro/Macro Vickers/Knoop	10gf - 10Kgf
W-4500	Vickers/Knoop	1Kgf - 50Kgf
W-4501	Brinell	1Kgf - 62.5Kgf
W-4502	Macro Vickers/Knoop	300gf - 50Kgf
W-4503	Micro/Macro Vickers/Knoop	100gf - 50Kgf
W-4504	Micro/Macro Vickers/Knoop/Brinell	100gf - 62.5Kgf

Premium Closed Loop Micro/Macro Vickers, Knoop & Brinell Hardness Tester NEXUS 4000 Series

High accuracy and repeatability through Closed Loop, Load Cell and Force feedback system, 11 models available.

TEST PROCEDURE CONTROL

Traditional hardness testing systems use a "dead weight" mechanical design or inaccurate spring force mechanism to apply the test force. Such systems lack test control as there is no feedback on the actual applied force. The Closed Loop technology with a force feedback system, as applied in the NEXUS 4000 series, constantly measures and controls the applied force on the tester's indenter and tested surface. Consequently, this superior control system offers an almost unlimited selection of test loads and test rates for virtually any test condition imaginable.

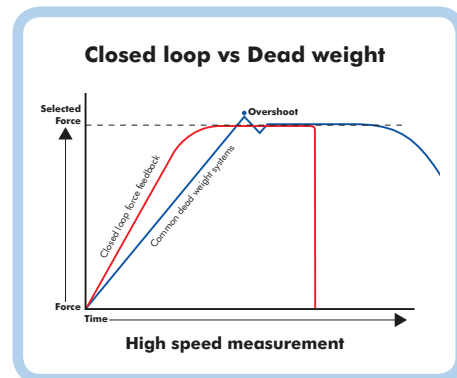
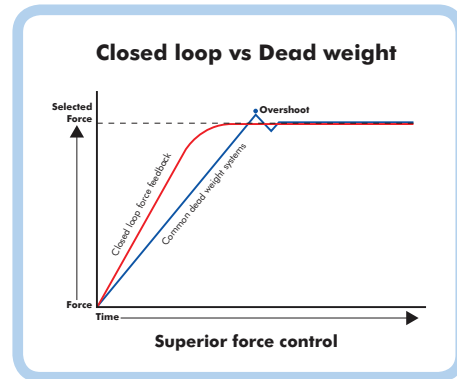
ACCURACY, RELIABILITY & EFFICIENCY

Elimination of overshoot due to sophisticated algorithms detecting contact with the indenter and the tested object's surface.

The application and removal of the test force is fully automatic, as well as the positioning of the indenter and the pre-determined objective. The result is an absolute vibration-free operation while reducing the operator's workload to a minimum.

UPGRADE

Upgrades on the NEXUS 4000 series are available on request. For instance, your budget and your requirements allow a Vickers tester; your choice could be an Eseyway Vickers / Knoop tester 4300. After your purchase you can upgrade your tester from, for instance, Vickers to Macro, Micro Vickers or even to Brinell at a fixed price. The upgrades are possible in the 4300 or 4500 range. Investing in an NEXUS 4000 series tester guarantees access to almost any load application in the Vickers, Knoop and Brinell range up to 62.5kg.



TECHNICAL SPECIFICATION

Test force selection	Electronic, Closed Loop, Load Cell, Force feedback system, indication in Kgf or N. Test force selectable over menu operation
Test procedure	Automatic, loading/dwell/unloading
Hardness value	5 digits
Loading speed	Variable, depending on selected force
Turret	4 positions over 360°, fully automatic, memorised start position, option for 2 indenters and 2 objectives or 1 indenter and 3 objectives
Test force accuracy	< +/-1% for force from 100gr to 30kg, < +/-1,5% for force below 100gr
User display	Length of diagonals, hardness value, converted value, test force, online statistics
Display resolution	0.1 HV, HK and HB
Hardness conversion	Rockwell, Rockwell Superficial, Brinell, Leeb & Tensile
Standardisation	EN, ISO 6507, EN ISO 6506, EN ISO 4545, ASTM E-384, ASTM E-10-08, ASTM E-384
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
Firmware	V2.01, German, English, French (standard), V2.02, English, Italian, Spanish
Memory	Memory for 20 test results, with INNOVAVIEW software unlimited results
Data output	RS-232 Bi-Directional
Loading mechanism	Fully automatic, Closed Loop, Force feedback, loading, dwell, unloading
Dwell time setting	Default 5 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 / camera
Vertical Range	165mm (maximum specimen height)
Horizontal Range	135mm (from centre line)
Stage dimensions	100x100mm, travel 20x20mm, and reading 0.01mm
Operating temperature	5°C to 40°C (+/-20° for force 25gr and 50gr)
Humidity	10% to 90% non condensing
Dimensions	220 x 540 x 650mm
Weight	51Kg
Power	220V/110V, 50/60Hz, single phase

IMPRESSIONS Video Measuring System

IMPRESSIONS is the new advanced user operating system that will be adopted on all future developments. The software incorporates manual and automatic measurement for all scales, image editing, file storing, image storing, report printing, turret operation, manual or automatic focusing and many other advanced functions.

All data can be copied or exported in to MS applications like Word, Excel, or a report generator that emails test results directly to your workstation, or server. All data can be accessed over the LAN or WLAN connections.

Standard delivery

For manual X-Y stage - IMPRESSIONS software, CCD camera and C-mount included software for manual and automatic measurement of indentations, Indent zoom function, automatic light adjustment, LCD industrial DVI touch screen included (IMP-2, IMP-3, IMP-4)

For motorized XY stage & auto focus - IMPRESSIONS software, motorized X-Y stage and motorized Z-axis. CCD camera and C-mount included. Software for manual and fully automatic measurement of indentations. Indent zoom function, automatic indent focus, automatic light adjustment, coordinate multi pattern testing module, motorized X-Y stage, LCD industrial touch screen included, virtual mouse function. (IMP-5 and IMP-6)



IMPRESSIONS VIDEO MEASURING SYSTEM

Code No	Description
W-IMP2	IMPRESSIONS software for manual X-Y stage
W-IMP3	IMPRESSIONS software with 1 analogue micrometer and 1 digital micrometer on XY stage
W-IMP4	IMPRESSIONS software with 2 digital micrometers on manual XY stage
W-IMP5MV	IMPRESSIONS software with 3Kg motorized XY stage and coordinate multi pattern testing module (for micro Vickers)
W-IMP5V	IMPRESSIONS software with 30Kg motorized XY stage and coordinate multi pattern testing module (for macro Vickers),
W-IMP6MV	IMPRESSIONS software with 3Kg motorized XY stage with Z axis auto focus and coordinate multi pattern testing module. (for micro Vickers)
W-IMP6V	IMPRESSIONS software with 30kg motorized XY stage with Z axis auto focus and coordinate multi pattern testing module.(for macro Vickers),

Micro/Macro Vickers Hardness Tester FALCON 500 Series

The FALCON 500 series, Micro Vickers, Vickers and Micro Brinell hardness testing machines are a new generation of instruments, improving conventional hardness testing methods and focused on eliminating user influence on the test results. The unique force actuator system utilizes an electronically controlled closed loop system and advanced force sensor technology, to achieve absolute accuracy, reliability and repeatability, on each of the forces used for a test.

The innovative software functions of IMPRESSIONS software allow file storing, test program setting and storing, image zoom, auto focus, limit settings, conversions to other hardness scales, system setup and (remote) control, pattern testing (CHD/Nht/Rht) and widely contributes to the high reproducibility of test results. Fully automatic image evaluation combined with intuitive operator software avoid operator influence on the test results.



W-501

W-501XL

Features

- Load cell, closed loop force control
- IMPRESSIONS operator control
- Auto Brightness
- Auto Contrast
- Auto Sharpness
- Auto Focus
- Automatic indent measurement
- 2 indenter positions, 4 objective positions
- 5mp HD camera
- High power LED vertical illuminator with filter position
- Anti-collision system
- Powerful Embedded Micro Controller; MS Windows, 80gb dual SSD data storage keyboard & mouse
- 15" portrait mode, HD industrial touch screen on adjustable table stand

Micro/Macro Vickers Hardness Tester FALCON 500 Series

Optional Accessories

- Overview camera
- Click & Go software option (requires motorised X-Y stage & Overview camera)
- Pattern testing (requires motorized X-Y stage)
- CHD, Nht, Rht (requires Pattern testing and motorized X-Y stage)
- Certified indenters
- Certified hardness test blocks
- Motorized X-Y stage
- 2nd indenter position
- 150mm Ø table
- Choice of objectives (see specification leaflet)
- V-anvil for 1-6mm
- V-anvil for 4-20mm

General functionality

Intuitive operator interface IMPRESSIONS

IMPRESSIONS software is the ultra-modern user interface of all Innovatest hardness testing machines. IMPRESSIONS offers unparalleled simplicity in operation but yet, includes the most advanced functions found in hardness testing.

With only a minimum of operator skills required, IMPRESSIONS guides you through the set up process, in just seconds. Standard features, complex tasks and advanced work flow at your fingertips.

Fully automatic image evaluation

IMPRESSIONS software evaluates sharpness and brightness of all camera images and measures the indentation independent of the operator. The automatic adjustment of the picture parameters ensures reproducible test results, even for different materials and difficult, scratched or damaged test surfaces.

The standard fast auto-focus technology guarantees a sharp image of the indentation, in just a few seconds.

Overview & full view zoom camera

The optional overview & full view autofocus zoom camera with additional surface illumination, ensures a perfect overview or full view on your sample or samples.

The combination of the zoom overview & zoom full view camera and superior measuring objectives ranges allow a viewing range of 60µm to 200mm. This technology allows an overall picture of the test subject or subjects or a further magnified part of the object. The overview/full view images can also be saved with the test report.

IMPRESSIONS 'click and go' functionality allows random test point selection on the screen, while the high speed motorized X-Y stage perfectly positions the selected test point under the indenter and measuring objective.

Anvils, X-Y stage or CNC motorized X-Y stage

The basic version provides a manual X-Y stage and a plane anvil with all the requirements for quick and easy single tests.

The FALCON allows to expanded to a wide choice of motorized X-Y stages while the IMPRESSIONS tester control and workflow software has many advanced positioning functions, from single indent to advanced pattern testing. The onboard controller allows up to 5 axis CNC work piece positioning.

Dynamic Z-Axis height adjustment

Intelligent precision positioning of the work piece is a standard feature on the FALCON series.

The 2 button control system allows ultra-fast pre-positioning, while the scroll wheel provides a pulse by pulse control on the actual fine adjustment on the focus position.

* All FALCON models have a standard auto-focus system!

Dual view screen technology

The dual screen option gives the image of the overview camera (normally also provided on a single screen solution) next to the standard operator screen. The advantage is that a larger image of the overview image can viewed simultaneous with the normal measurement camera images.



Micro/Macro Vickers Hardness Tester

FALCON 500 Series

TECHNICAL SPECIFICATION

Hardness scale	(Micro/Macro) Vickers, Knoop & Brinell
Load application	Load cell, force feedback, closed loop system
Load range	1gf up to 62.5Kgf
Motorized turret	6 positions; 2 indenter positions, 4 objectives positions
Optical system	High definition, 5Mpx machine Vision system
Objectives	2.5x, 5x, 10x, 20x, 40x, 60x, 100x
Overview & full view	5Mpx optical ZOOM camera, field of view 35x35mm / 200x200mm
Electronic system	High performance embedded micro system controller, MS Windows®, 15" full color industrial touch screen, automatic and manual measurement
Test loads	1gf, 2gf, 3gf, 4gf, 5gf, 6gf, 7gf, 8gf, 9gf, 10gf, 20gf, 25gf, 50gf, 100gf, 200gf, 300gf, 500gf, 1kgf, 2kgf, 2.5kgf, 3kgf, 4kgf, 5kgf, 6.25kgf, 10kgf, 15.625kgf, 20kgf, 25kgf, 30kgf, 31.25kgf, 50kgf, 62.5kgf
Vickers test range	HV0.001, HV0.002, HV0.003, HV0.004, HV0.005, HV0.006, HV0.007, HV0.008, HV0.009, HV0.010, HV0.020, HV0.025, HV0.050, HV0.1, HV0.2, HV0.3, HV0.5, HV1, HV2, HV2.5, HV3, HV4, HV5, HV10, HV20, HV25, HV30, HV50
Brinell test range	HB1/1kgf, HB1/2.5kgf, HB1/5kgf, HB1/10kgf, HB1/30kgf; HB2.5/6.25kgf, HB2.5/15.625kgf, HB2.5/31.25kgf, HB2.5/62.5kgf
Knoop	HK0.01, HK0.02, HK0.025, HK0.05, HK0.1, HK0.2, HK0.3, HK0.5, HK1, HK2, HK5
Indentors	Factory indentors or certified indentors (DKD, UKAS, ASTM) (optional)
Test cycles	Fully automatic, automatic and manual
Standards	Complies to or exceeds, ISO, ASTM, JIS (Nadcap) standards
Test force accuracy	<1% for test force 200gr to 62.5kg, <1.5% for test force below 100gr
Display resolution	0.1 HV, HK, 0.5 HB
Hardness conversion	Rockwell, Rockwell Superficial, Brinell, Leeb & Tensile
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Data storage capacity	Dual SSD 80Gb, RAID system
Connectivity	2 USB ports, RJ45 Ethernet LAN, W-LAN, RS-232, Blue Tooth, 5 Axis CNC & motorized X-Y stage connector
Dwell time setting	Default 10 seconds, user defined 1 to 99 seconds (1 sec increments)
Printer	A4, A3 full colour laser printer (optional)
Manual stage dimensions	Stage 100mm x 100mm, Travel 25mm x 25mm, Reading 0.01mm
Operating temperature	101/4C to 351/4C, non-condensing
Humidity	10% to 90% non-condensing
Machine dimensions	485mm x 322mm x 683mm 525mm x 323mm x 773mm (XL)
Machine weight	60kg, 75kg(XL)
Power consumption	100W
Power supply	100VAC to 240VAC, 50/60Hz, single phase

FALCON 500 SERIES TESTER

Code	Description	Code	Description
W-501	3gf - 2kgf, Vickers & Knoop	W-501XL	3gf - 2kgf, Vickers & Knoop, large frame
W-502	50gf - 10kgf, Vickers, Knoop & Brinell	W-502XL	50gf - 10kgf, Vickers, Knoop & Brinell, large frame
W-503	10gf - 10kgf, Vickers, Knoop & Brinell	W-503XL	10gf - 10kgf, Vickers, Knoop & Brinell, large frame
W-504	1gf - 10kgf, Vickers, Knoop & Brinell	W-504XL	1gf - 10kgf, Vickers, Knoop & Brinell, large frame
W-505	200gf - 31.25kgf, Vickers, Knoop & Brinell	W-505XL	200gf - 31.25kgf, Vickers, Knoop & Brinell, large frame
W-506	50gf - 31.25kgf, Vickers, Knoop & Brinell	W-506XL	50gf - 31.25kgf, Vickers, Knoop & Brinell, large frame
W-507	10gf - 31.25kgf, Vickers, Knoop & Brinell	W-507XL	10gf - 31.25kgf, Vickers, Knoop & Brinell, large frame
W-508	1gf - 31.25kgf, Vickers, Knoop & Brinell	W-508XL	1gf - 31.25kgf, Vickers, Knoop & Brinell, large frame
W-509	200gf - 62.5kgf, Vickers, Knoop & Brinell	W-509XL	200gf - 62.5kgf, Vickers, Knoop & Brinell, large frame
W-5010	10gf - 62.5kgf, Vickers, Knoop & Brinell	W-5010XL	10gf - 62.5kgf, Vickers, Knoop & Brinell, large frame
W-5011	1gf - 62.5kgf, Vickers, Knoop & Brinell	W-5011XL	1gf - 62.5kgf, Vickers, Knoop & Brinell, large frame

Universal Hardness Tester VERZUS 700 Series

The VERZUS 700 series is a new generation of hardness testing machines. Featuring closed loop system based on a precision load cell, guarantees the best GR & R results ever seen on Universal hardness testers. Test forces ranging from 1 to 250kgf.



W-700-AS



W-750-LCD

Features

- Load cell, force feedback, closed loop system
- Unparalleled rigidity
- Unmatched GR & R results
- Load range 1kgf up to 250kgf depending on model
- Complies to all applicable EN/ISO, ASTM and JIS standards
- Shape correction settings for curved surfaces
- Optical depth measuring system (**Rockwell, HBT, HVT, Hb**)
- Powerful Embedded PC with 2 hard disks and HD industrial touch screen (**VERZUS 750 models**)
- IMPRESSIONS™ high end video based hardness testing firmware including CCD camera, automatic indent measurement, indent ZOOM system, conversion to other hardness scales, test data & image storage, statistic results storage, Jominy stage operation, X-Y stage operation (**VERZUS 750 models**)
- OLED full colour user-friendly interface, easy to operate (**VERZUS 700 RS, RSB, AS models**)
- Go / No Go function with visual and acoustic warning (**VERZUS 700 RS, RSB, AS models**)
- Large memory for measurements with statistic results (**VERZUS 700 RS, RSB, AS models**)
- Easy calibration function
- Testing program storage
- Standard nose cone clamping attachment
- Printer & USB-2 output (**VERZUS 700 RS, RSB, AS models**)
- External Brinell microscope with LED ring light (**RSB model**)
- Built on Vickers / Brinell microscope with LED ring light (**AS, CCD models**)
- Work piece sliding table (**AS, CCD models**)
- Large work piece accommodation
- Motorised spindle (**Optional**)

Universal Hardness Tester VERZUS 700 Series


W-700-AS

W-750-LCD

TECHNICAL SPECIFICATION

Load application	Load cell, force feedback, closed loop system
Hardness scales (RS)	Rockwell / Superficial Rockwell, HVT, HBT, Hb
Hardness scales (RSB)	Rockwell / Superficial Rockwell, Brinell, HVT, HBT, Hb
Hardness scales (AS)	Rockwell / Superficial Rockwell, Brinell, Vickers, HVT, HBT, Hb
Hardness scales (LCD)	Rockwell / Superficial Rockwell, HVT, HBT, Hb
Hardness scales (CCD)	Rockwell / Superficial Rockwell, Brinell, Vickers, HVT, HBT, Hb
Load range (RS)	1kgf to 187.5kgf
Load range (RSB/AS)	1kgf to 250kgf
Load range (LCD)	1kgf to 187.5kgf
Load range (CCD)	1kgf to 250kgf
Test loads	1, 2, 2.5, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5, 250kgf depending on model.
Vickers test range	HV1, HV 2, 3, 5, 10, 20, 30, 50, 100, 120kgf; HVT 50, 100kgf
Brinell test range	HB1/2.5, 5, 10, 31.25kgf; HB2.5/6.25, 15.625, 31.25, 62.5, 187.5kgf; HB5/25, 62.5, 125kgf; HB10/100kgf; HBT2.5/62.5, 187.5kgf
Rockwell scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V
Rockwell superficial scales	15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y
Optical system (RS)	None
Optical system (RSB)	External Brinell microscope with LED ring light
Optical system (AS)	Built on electronic microscope with 3 objectives and LED ring light
Optical system (LCD)	None
Optical system (CCD)	High resolution 5Mp video camera mounted on built on Microscope
Objectives (AS, CCD)	Interchangeable 2.5x, 5x and 10x magnification with LED ring light (CCD)
Eyepiece (AS, LCD)	10x magnification (15x optional)
Scale resolution (depth)	0.1 micron
Display (RS, RSB, AS)	Full colour OLED display, testing results, statistics, built-in hardness calculator, program overview, settings, calibration and many more
Display (LCD, CCD)	Large high definition industrial touch screen can also be operated by mouse and keyboard
Standards	Complies to, or exceeds, EN/ISO, ASTM and JIS
Test cycles	Fully automatic, Load, Dwell, Unload
Force control	1- 99 seconds
Data output	USB-2., RS-232 (RS, RSB, AS) RJ-45 LAN, W-LAN (LCD, CCD)
Specimen accommodation	Height 300mm Throat 200mm

Standard Delivery

- Brinell microscope with LED ring light for dark field illumination **(AS, RSB, CCD)**
- Objectives for 37.5x, 75x and 150x magnification **(AS, CCD)**
- Sliding testing table **(AS, CCD)**
- Flat anvil, hardened, \varnothing 60mm
- Testing table, hardened, \varnothing 180mm
- V-anvil hardened \varnothing 40mm
- Fuse 3A slow 2 pcs
- Power cable
- INNOVATEST® certificate
- Installation and user manual
- Test blocks and indenters optional

Optional Accessories

- Knoop hardness testing scale **(CCD)**
- V-Anvil 60mm
- Certified indenters
- Certified or factory reference hardness blocks
- Long indenters
- Goose neck indenter holder
- Large testing table 300 x 200mm with T-slot
- Custom testing tables
- Precision vices, V-blocks and special clamps

UNIVERSAL HARDNESS TESTER VERZUS 700 SERIES

Code	Description
W-700-RS	Rockwell, Superficial Rockwell, HVT, HBT, Hb, Plastic ISO 2039/1
W-700-RSB	Rockwell, Superficial Rockwell, Brinell, HVT, HBT, Hb, Plastic ISO 2039/1
W-700-AS	Rockwell, Superficial Rockwell, Brinell, Vickers, HVT, HBT, Hb, Plastic ISO 2039/1
W-750-RS	Rockwell, Superficial Rockwell, HVT, HBT and Ball indentation for plastic ISO 2039/1
W-750-RSB	Rockwell, Superficial Rockwell, Brinell, HVT, HBT and Ball indentation for plastic ISO 2039/1
W-750-LCD	Rockwell, Superficial Rockwell, HVT, HBT, Hb, Plastic ISO 2039/1
W-750-CCD	Rockwell, Superficial Rockwell, Brinell, Vickers, HVT, HBT, Hb, Plastic ISO 2039/1

Universal Hardness Tester NEXUS 7501 Series

The NEXUS 7501 universal hardness tester is based on the successful NEXUS 7000 load cell closed loop concept with indenter/objective swivel system.

The NEXUS 7501 is a hardness tester for all hardness procedures according to Rockwell, Superficial Rockwell, Brinell, Vickers and Knoop. Also possible are ball and indentation hardness testing for thermo plastics and the new Vickers depth (HVT) and Brinell depth (HBT) procedures.

The load range goes from 1 to 250kgf (optional from 0.5kgf). All procedures complying to EN/DIN/ISO, ASTM and JIS.

The new user interface IMPRESSIONS guarantees hassle free tester operation with a minimum amount of training. IMPRESSIONS allows you to operate the tester's main functions but also incorporates advanced algorithms for automatic impression detection and hardness measurement.



W-7501

Universal Hardness Tester NEXUS 7501 Series


W-7501

TECHNICAL SPECIFICATION

Hardness scales	Brinell, Vickers, Rockwell, Superficial Rockwell, Knoop, Vickers depth (HVT), Brinell depth (HBT), Plastic
Optical	5 mega-pixel HD camera, indent zoom function
Load range	1-250kgf
Display	High resolution industrial LCD touch screen Optional: desk top LCD screen Optional: desk top LCD touch screen Optional: Height adjustable LCD touch screen
CPU	Embedded high performance PC with 2 solid state HD drives Optional: External high performance PC
Firmware	IMPRESSIONS, advanced hardness testing software including options for: manual measurement, automatic measurement, indent zoom function, scale, conversion, file storage, report printing, test program storage, machine settings storage, graphic interface for swivel system position
Standards	Conforms to ISO 6506, 6507, 6508, 4545, ASTM E18, E92, E10 & JIS
Test load type	Loadcell closed loop, force feedback system Complies to EN/ISO and ASTM standards
Test cycle	Automatic and indent evaluation
Test loads	(0,5*) 1, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 50, 60, 62.5, 100, 125, 150, 187.5, 250kgf
Brinell test procedures	HB1 1, 2.5, 5, 10, 30 HB2.5: 6.25, 15.625, 31.25, 62.5, 187.5 HB5: 25, 62.5, 125, 250 HB10: 100, 250
Vickers test procedures	HV (0,5*) 1, 2, 3, 5, 10, 20, 30, 50, 100
Rockwell test procedures	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, Bm, Fm, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X,30X, 45X, 15Y, 30Y, 45Y, 30 TM, HMR 5/25
Indenter types (included)	Brinell Balls: 1, 2.5, 5, 10mm Vickers Diamond: 136° Rockwell Diamond Cone: 120° Balls: 1/16 in, 1/8 in, 1/4 in, 1/2 in
Load duration	0.1-255 seconds
Connectivity	USB-2(6) RS-232, UTP RJ45, LAN, W-LAN
Specimen accommodation	Maximum test height 300mm, maximum throat 220mm
Specimen access	External surfaces, internal surfaces with goose neck adapter (optional)
Dimensions	620mm x 250mm x 900mm (L x W x H)
Weight	170kg
Power Supply	230V / 50Hz other voltages and/or frequencies on request

Standard Delivery

- Objective for 70x magnification
- Objective for 140x magnification
- Clamping protection nose
- Testing table Ø80mm
- Power cable
- Installation & user manual
- INNOVATEST® certificate
- Test blocks and indenters optional

Optional Accessories

- Objectives for 10x, 20x, 44x magnification
- Testing table Ø150mm
- Testing table Ø235mm
- V-Anvil Ø80mm
- V-Anvil Ø120mm
- Certified indenters and hardness test blocks
- Long Vickers indenter
- Other testing tables and XY stages
- Precision vices, V-blocks and special clamps
- Software solutions for advanced application

UNIVERSAL HARDNESS TESTER NEXUS 7501 SERIES

Code	Description
W-7501	Universal hardness tester with video indent measuring system

Universal Hardness Tester NEXUS 8000 Series

The NEXUS 8000 Series can be used for all hardness procedures according to standards Rockwell, Superficial Rockwell, Brinell, Vickers and Knoop. But it is also capable of ball and indentation hardness testing for thermoplastics and the new Vickers depth (HVT) and Brinell depth (HBT) procedures. The NEXUS 8000 universal hardness testers include all standard hardness testing methods between 1kgf - 250kgf(8001), 3kgf - 750kgf(8002), 10kgf - 3000kgf(8003). All procedures meet or exceed DIN, ISO, ASTM and JIS standards.



TECHNICAL SPECIFICATION

Hardness scales	Rockwell, Vickers, Brinell, Vickers depth (HVT), Brinell depth (HBT), Ball indentation for plastic ISO 2039/1
Load application	Load cell, force feedback, closed loop system
Load range	1kgf - 250kgf (NEXUS 8001) 3kgf - 750kgf (NEXUS 8002) 10kgf - 3000kgf (NEXUS 8003)
Motorized turret	3 indenter positions, 3 objectives positions
Optical system	High definition, 5Mp machine Vision system
Objectives	3 installed for 0.7x - 1000x magnification
Electronic system	High performance embedded micro PC, MS Windows®, 15" full color touch screen, automatic and manual measurement Standards Meets or exceeds, ISO, ASTM, JIS (Nadcap) standards
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y (8003 no superficial scales)
Vickers test range	1kgf - 120kgf (depending on model) HV: 1kgf, 2kgf, 3kgf, 4kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf, 100kgf, 120kgf HVT: 50kgf, 100kgf
Brinell test range	1kgf - 3000kgf (depending on model) HB1: 1kgf, 2.5kgf, 5kgf, 10kgf, 30kgf HB2.5: 6.25kgf, 15.625kgf, 31.25kgf, 62.5kgf, 187.5kgf HB5: 25kgf, 62.5kgf, 125kgf, 250kgf HB10: 100kgf, 250kgf, 500kgf, 750kgf, 1000kgf, 1500kgf, 3000kgf HBT: 5kgf, 250kgf
Test cycles	Fully automatic, automatic and manual
Force tolerance	<0.5%
Force control	1 - 99 seconds
Connectivity	USB (4), UTP-RJ45-LAN, W-LAN, RS232, Motorized X-Y stage
Workpiece accommodation	Vertical capacity 350mm, Horizontal capacity 250mm (from center-line)
Operating temperature	10°C to 35°C, non-condensing
Machine dimensions	380mm x 753mm x 1390mm
Machine weight	425kg
Power supply	100V AC to 240V AC, 50Hz/60Hz, single phase

UNIVERSAL HARDNESS TESTER NEXUS 8000 SERIES

Code No	Description
W-8001	Universal hardness tester with video indent measuring system with Brinell, Vickers, Rockwell, Superficial Rockwell, Knoop, HVT, HBT, Ball indentation, test forces 1kgf - 250kgf
W-8002	Universal hardness tester with video indent measuring system with Brinell, Vickers, Rockwell, Superficial Rockwell, HVT, HBT, Ball indentation, test forces 3kgf - 750kgf
W-8003	Universal hardness tester with video indent measuring system with Brinell, Vickers, Rockwell, HVT, HBT, Ball indentation, test forces 10kgf - 3000kgf

Standard Delivery

- Flat anvil, hardened, Ø 80mm
- V-anvil, hardened, Ø 80mm
- Testing table, hardened, Ø 200mm
- Ringlight for (Brinell) dark field illumination
- Power cable
- Four adjustable feet
- INNOVATEST® calibration certificate
- Installation and user manual

Optional Accessories

- Flat anvil, hardened, Ø 80mm
- V-anvil, hardened, Ø 80mm
- Testing table, hardened, Ø 200mm
- Ringlight for (Brinell) dark field illumination
- Power cable
- Four adjustable feet
- Calibration certificate
- Installation and user manual

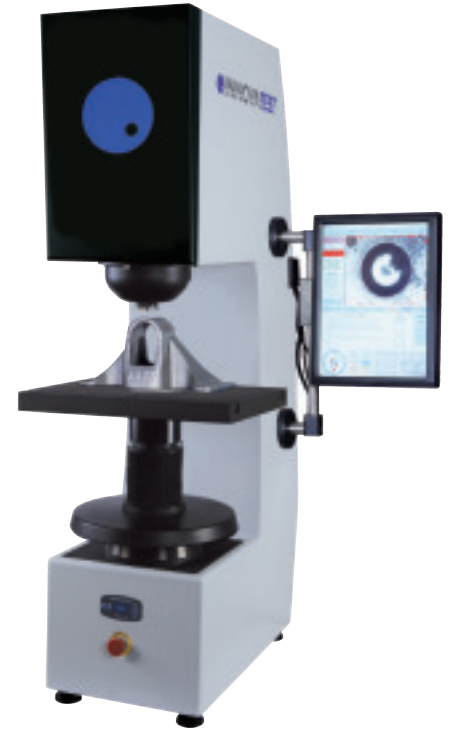
Heavy Duty Universal and Brinell Hardness Tester NEXUS 8000XL Series

The sturdy design of the NEXUS 8000XL Series allows rough workshop conditions. The tester can be used for measuring hardness according to global standards in most of the common hardness scales: Rockwell, Superficial Rockwell, Brinell, Vickers and Knoop. But it is also capable of ball and indentation hardness testing for thermoplastics and the Vickers depth (HVT) and Brinell depth (HBT) procedures. The NEXUS 8000XL Universal hardness testers applies all common test forces between 1kgf - 250kgf (8001XL), 3kgf - 750kgf (8002XL), 10kgf - 3000kgf (8003XL). All procedures meet or exceed DIN, ISO, ASTM and JIS standards.



TECHNICAL SPECIFICATION

Hardness scales	Rockwell, Vickers, Brinell, Vickers depth (HVT), Brinell depth (HBT),
Ball indentation	for plastic ISO 2039/1
Load application	Load cell, force feedback, closed loop system
Load range	1kgf - 250kgf (8001XL), 3kgf - 750kgf (8002XL), 10kgf - 3000kgf (8003XL)
Motorized turret	3 indenter positions, 3 objectives positions
Optical system	High definition, 5Mp machine Vision system
Objectives	3 installed for 0.7x - 1000x magnification
Electronic system	High performance embedded micro system controller, MS Windows® , 15" full color touch screen, automatic and manual measurement Standards Meets or exceeds, ISO, ASTM, JIS (Nadcap) standards
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V, 15N, 30N, 45N, 15T, 30T, 45T, 15W, 30W, 45W, 15X, 30X, 45X, 15Y, 30Y, 45Y (8003XL no superficial scales)
Vickers test range	1kgf - 120kgf (depending on model) HV: 1kgf, 2kgf, 3kgf, 4kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf, 100kgf, 120kgf HVT: 50kgf, 100kgf
Brinell test range	1kgf - 3000kgf (depending on model) HB1: 1kgf, 2.5kgf, 5kgf, 10kgf, 30kgf HB2.5: 6.25kgf, 15.625kgf, 31.25kgf, 62.5kgf, 187.5kgf HB5: 25kgf, 62.5kgf, 125kgf, 250kgf HB10: 100kgf, 250kgf, 500kgf, 750kgf, 1000kgf, 1500kgf, 3000kgf HBT: 5kgf, 250kgf
Test cycles	Fully automatic, automatic and manual
Force tolerance	<0.5%
Force control	1 - 99 seconds
Connectivity	USB (4), UTP-RJ45-LAN, W-LAN, RS232, Motorized X-Y stage
Workpiece accommodation	Vertical capacity 520mm Horizontal capacity 300mm (from center-line)
Operating temperature	10°C to 35°C, non-condensing
Machine dimensions	380mm x 830mm x 1680mm
Machine weight	540kg
Power supply	100V AC to 240V AC, 50Hz/60Hz, single phase



Standard Delivery

- Workpiece clamping attachment
- Large work piece table 600mm x 500mm with T slot
- Ringlight for (Brinell) dark field illumination
- Wireless mouse and keyboard
- Power cable
- Four adjustable feet
- INNOVATEST® calibration certificate
- Installation and user manual

Optional Accessories

- Certified indenters
- Factory reference hardness blocks
- Certified reference hardness blocks
- Testing table, hardened, Ø 200mm
- Flat anvil, hardened, Ø 80mm
- V-anvil, hardened, Ø 80mm
- Motorised X-Y stages, motorised rotary or tilting tables
- Built-in 5 axis support driver
- Solid tester stand and storage cabinet

HEAVY DUTY UNIVERSAL AND BRINELL HARDNESS TESTER NEXUS 8000XL SERIES

Code No	Description
W-8001XL	Universal hardness tester, tall version, with video indent measuring system Brinell, Vickers, Rockwell, Superficial Rockwell, Knoop, HVT, HBT, Ball indentation, test forces 1kgf-250kgf
W-8001XLM	Universal hardness tester, tall version with motorized spindle and video indent measuring system Brinell, Vickers, Rockwell, Superficial Rockwell, Knoop, HVT, HBT, Ball indentation, test forces 1kgf-250kgf
W-8002XL	Universal hardness tester, tall version, with video indent measuring system Brinell, Vickers, Rockwell, Superficial Rockwell, HVT, HBT, Ball indentation, test forces 3kgf-750kgf
W-8002XLM	Universal hardness tester, tall version with motorized spindle and video indent measuring system Brinell, Vickers, Rockwell, Superficial Rockwell, HVT, HBT, Ball indentation, test forces 3kgf-750kgf
W-8003XL	Universal hardness tester, tall version, with video indent measuring system Brinell, Vickers, Rockwell, HVT, HBT, Ball indentation, test forces 10kgf-3000kgf
W-8003XLM	Universal hardness tester, tall version with motorized spindle and video indent measuring system Brinell, Vickers, Rockwell, HVT, HBT, Ball indentation, test forces 10kgf-3000kgf

Universal Hardness Tester NEMESIS 9000 Series

The NEMESIS 9000 Series represents the latest top of the range development in universal hardness testing. Modern design, innovated technology, multi purpose hardness testing instrument, based on the application of mechatronic components and high resolution video machine vision systems. A superior level of precision combined with high definition imaging creates an almost unlimited field of applications.

The NEMESIS 9000 Series represents universal hardness testing in the most versatile meaning. Aircraft engine parts, automobile parts, production lines, general quality assurance and laboratory use are all fields covered by the NEMESIS 9000 Series.

Manual operation or full scale automation to the highest possible level are both standard on the NEMESIS 9000.

The NEMESIS 9000, Load Cell, Closed loop, Force feedback system is suitable for the following:

Optical Hardness Testing Methods:

- Vickers (HV), EN ISO 6507, ASTM E 92
- Knoop (HK) ISO 4545, 4546
- Brinell (HB) EN ISO 6506, ASTM E 10

Depth Measuring Hardness Testing Methods:

- Rockwell (HR) EN ISO 6508, ASTM E 18
- Vickers depth measurement HVT VDI/VDE 2616-1
- Brinell depth measurement HBT VDI/VDE 2616-1
- Ball indentation hardness (H) (ISO 2039-1) (plastics)



Features

- Rockwell, Superficial Rockwell, Vickers, Knoop, Brinell, Ball indentation, HVT and HBT scales
- Superior range of test loads/force application ranging from 1kgf to 3000kgf (over 3 models)
- Fixed work piece position (no spindle)
- Descending test head with automatic work piece detection
- Free definable, manual or motorised 6 position turret for objectives and indenters of choice
- High definition optical system for images of 0.7x to 1000x magnification
- PC based hardness testing firmware and database file system as standard
- Large, adjustable 15" industrial touch screen
- Automatic or manual focus, manual or fully automatic indent measurement standard
- Built-in hard disk offers nearly endless file storing, standard
- LAN, WLAN, USB-2, RS-232, Printer and DVI connectivity, standard
- On board built-in driver for (optional) motorised X-Y stage, standard
- Free definable test patterns case depth, traverse, free style, etc., optional
- Machine covers made of shock, damage and fire proof recyclable materials
- Large range of optional accessories
- Large test piece accommodation H=300mm, D=220mm can be upgraded to a taller frame of, for instance, H=450mm, D=220mm or 300mm; even years after purchasing the tester
- 3 years free firmware upgrade, standard
- Designed and manufactured in The Netherlands



Universal Hardness Tester NEMESIS 9000 Series

TECHNICAL SPECIFICATIONS

	W-9001 Universal	W-9002 Universal	W-9003 Universal	W-9004 Pure Rockwell	W-9005 Pure Vickers	W-9006 Pure Brinell
Scales / Test Loads/Force	1kgf to 250kgf	3kgf to 750kgf	10kgf to 3000kgf	3kgf to 150kgf	1kgf to 120kgf	10kgf to 3000kgf
Rockwell, A, B, C, D, E, F, G, H, K, L, M, P, R, V	All scales	All scales	All scales	All scales	No	No
Superficial Rockwell, N, T, X, Y	All scales	All scales	No	All scales	No	No
Macro Rockwell HRM	Yes	Yes	Yes	Yes	No	No
Vickers HV	1kgf to 120kgf	3kgf to 120kgf	10kgf to 120kgf	No	500gf to 120kgf	No
Knoop	All scales	All scales	No	No	All scales	No
HVT	50, 100kgf	50, 100kgf	50, 100kgf	No	No	No
Brinell	1kgf to 250kgf	3kgf to 750kgf	10kgf to 3000kgf	No	No	10kgf to 3000kgf
HBT	5/250	5/250	5/250	No	No	No
H (ball indentation)	Up to 250kgf	Up to 750kgf	Up to 3000kgf	No	No	Up to 3000kgf

Force Application System

Linear force actuator	Standard	Standard	Standard	Standard	Standard	Standard
Load cell, closed loop, force feed back system	Standard	Standard	Standard	Standard	Standard	Standard
Motorised heavy duty TURRET with 6 positions	Standard	Standard	Standard	Standard	Standard	No
Indenter positions	3	3	3	3 (or 6, option)	3	None
Objective positions	3	3	3	None	3	None
LED optical indent illumination	Standard	Standard	Standard	None	Standard	None
LED ring light indent illumination	Optional	Optional	Optional	None	Optional	None
	175-200	0.007				

Optical Measuring System

5 mega pixels optical ZOOM system	Standard	Standard	Standard	None	Standard	None
Auto focus	Standard	Standard	Standard	No	Standard	No
Manual focus	Standard	Standard	Standard	No	Standard	No
Fully automatic indent measuring	Standard	Standard	Standard	No	Standard	No
Manual on screen indent measuring	Standard	Standard	Standard	No	Standard	No
Zoom and magnification ratio	0.7x to 1000x	0.7x to 1000x	0.7x to 1000x	No	0.7x to 1000x	No
Dual view working area overview camera	Optional	Optional	Optional	No	Optional	No
External Electronic Brinell microscope and objectives	No	No	No	No	No	Standard

Depth Measurement System

Heidenhain™ high resolution scale & reading head	Standard	Standard	Standard	Standard	No	No
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Hardware & User Interface

Built-in industrial Pentium PC and harddrive	Standard	Standard	Standard	Standard	Standard	No
Adjustable 15" full color industrial touch screen	Standard	Standard	Standard	Standard	Standard	No
MS Windows 7 Ultimate license	Standard	Standard	Standard	Standard	Standard	No
W-9000 hardness testing firmware	Standard	Standard	Standard	Standard	Standard	No
Automatic image and file storage	Standard	Standard	Standard	No	Standard	No
Stores and handles 3000 files & images	Standard	Standard	Standard	Standard	Standard	No
Stores and handles 9000 files & images	Optional	Standard	Standard	Standard	Standard	No
Forms 9000 set of customised certificates	Optional	Standard	Standard	Standard	Standard	No
Universal motorised X-Y stage controls	Standard	Standard	Standard	Standard	Standard	No

Connectivity

External digital (DVI) TFT screen output	Standard	Standard	Standard	Standard	Standard	No
External keyboard & mouse connections	Standard	Standard	Standard	Standard	Standard	No
LAN (local area network connection)	Standard	Standard	Standard	Standard	Standard	No
WLAN (Wireless network connection)	Standard	Standard	Standard	Standard	Standard	No
Bi-directional RS-232	Standard	Standard	Standard	Standard	Standard	Standard
Printer / USB-2 output	Standard	Standard	Standard	Standard	Standard	Standard
Built-in motorized X-Y stage driver	Standard	Standard	Standard	Standard	Standard	No

Work piece accommodation height: 300mm (opt. 500mm)

Work piece accommodation horizontal: 220mm from center

Machine dimensions: 1400mm x 420mm x 640mm (HxWxD)

Machine weight: 242kg

Tester colour (standard): Black / Metallic silver

Light source: White power LED (Opt. green/blue/red)

Power: 220volt / 50Hz, others on request

Objectives: 3 installed for 0.7x to 1000x

Force tolerance: Max. < 1%

Force control: 1-99 sec.

Hardness resolution: 0.01 Rockwell, 0.1 Vickers, 1 Brinell

Universal Hardness Tester NEMESIS 9500 Series

Load cell, closed loop,
linear force actuator,
fixed workpiece position

Force configuration for
maximum 250kgf, 750kgf
or 3000kgf

High performance PC, Windows 7
operating system with refined algorithms
for automatic image measuring system

6 positions modular motorised turret,
5 Mp built-in camera,
Optional overview camera

15" high
resolution
industrial
touch-screen

LED illumination,
LED ringlight

Microscope quality
optical system with
long working distance
objectives

Motorised spindle



W-9501



Universal Hardness Tester NEMESIS 9500 Series

The NEMESIS 9500 is the universal hardness tester most suitable for heavy duty testing in the Eseyaw standard range of testers. Partly based on the technology of the NEMESIS 9000. Built for tough environments, the floor type welded frame reaches a height of 2 meters and offers a work space of not less than 650mm height and a throat depth of 300mm.

Rockwell, Vickers and Brinell, but also pure depth test methods such as H, HVT and HBT are part of the standard test procedures of the NEMESIS 9500. 3 models cover a range of test loads either up to 250kgf, 750kgf or 3000kgf.

The frame of the NEMESIS 9500 is equipped with a heavy duty motorised spindle, allowing positioning of the test piece on the required working height. The NEMESIS 9500 has a descending test head allowing each test piece to be tested on an ergonomic working height. The linear actuator of the NEMESIS 9500 is equipped with a load cell closed loop system guaranteeing excellent accuracy and a wide range of fast testing procedures.

The test head is equipped with a 6 positions modular turret (indenters and objectives) and an optical zoom video system with 5mp HD camera. High performance PC driven automatic and manual indent measurement with automatic filing and storage functions.

Refined algorithms for automatic measurement on materials normally less suitable for automatic measurement.

Three years free firmware upgrade as standard.

TECHNICAL SPECIFICATION

Hardness scales	Brinell, Vickers, Rockwell, HVT, HBT
Load application	Load cell, force feed back, closed loop system
Load range	1-250kgf, 3-750kgf, 10-3000kgf
Motorised turret	3 indenter positions; 3 objectives positions
Optical system	High definition, 5Mp machine Vision system
Objectives	3 installed for 0.7x-1000x magnification
Scale resolution	0.0005mm (0.5 micron)
Electronic system	High performance built-in PC, Windows 7, 15" full color touch screen, automatic and manual measurement
Standards	Complies to all applicable EN/ISO and ASTM standards
Test loads	1, 2, 2.5, 3, 5, 10, 15, 15.625, 20, 30, 31.25, 45, 50, 60, 62.5, 100, 125, 150, 187.5, 250, 750, 3000kgf
Vickers test range	1 - 120kgf (depending on model)
Brinell test range	1 - 3000kgf (depending on model)
Rockwell test scales	A, B, C, D, E, F, G, H, K, L, M, P, R, S, V
Test cycles	Automatic & Manual
Force control	2-99 seconds
Connectivity	USB-2, Blue tooth, WLAN, LAN
Specimen accommodation	Max. height: 650mm Max. throat: 400mm
Machine dimensions	2125mm x 998mm x 540mm (HxDxW)
Machine weight	1100kg
Power supply	220V / 50Hz others on request

Standard Delivery

- Motorised turret with 6 positions
- Objectives for 0.7x-1000x magnification
- Built-in 3 axis support driver
- Large testing table
- Installation & user manual
- Innovatest calibration certificate
- Toolset
- Test blocks and indenters optional

Optional Accessories

- Built-in 5 axis support driver
- Testing table Ø235mm
- V-Anvil Ø80mm
- V-Anvil Ø120mm
- Certified indenters & hardness test blocks
- Long Vickers indenter
- Other testing tables and XY-stages
- Precision vices, V-blocks and special clamps

UNIVERSAL HARDNESS TESTER NEMESIS 9500 SERIES

Code	Description
W-9501	Heavy duty, video based universal hardness tester, test forces 1kgf to 250kgf
W-9502	Heavy duty, video based universal hardness tester, test forces 3kgf to 750kgf
W-9503	Heavy duty, video based universal hardness tester, test forces 10kgf to 3000kgf

Hardness Reference Blocks For All Scales

With official calibration certificates UKAS, DKD or ASTM.

CV Instruments hardness reference blocks are used for annual verification and calibration of hardness testing machines, as well as for periodical check and sometimes for overtaking of hardness scales on a hardness testing machine. That's why hardness reference blocks are a necessary help of industrial Quality Management. Only the use of high quality, precise hardness reference blocks calibrated to applicable standards can ensure the functionality and relative reliability and accuracy of measurement of a hardness testing machine.

The hardness reference blocks used for indirect verification should conform largely to the workpiece to be tested, in terms of material characteristics and hardness range. For this reason a hardness reference block made of aluminium was developed for the lower hardness range which can not be covered by steel, using new materials technology methods.

When using hardness reference blocks it is irrelevant whether the value of the nominal hardness to be delivered corresponds exactly to the actual calibration value observed, since scale adaptation should be carried out with at least two hardness values.

A hardness reference block shall only be used as according to the standards to that method and test condition for which it was calibrated.

CV Instruments certified hardness reference blocks are available as follows and all conform to the international standards as mentioned above.

Hardness reference "soft" blocks made of aluminium

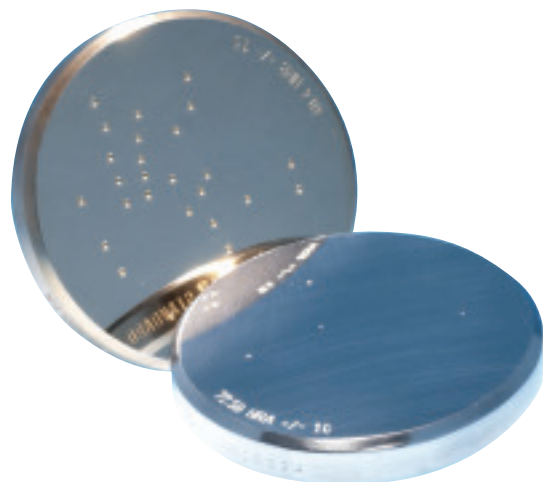
These CV Instruments reference blocks are available with DKD/MPA certificate only.

For several years there has been a need for "soft" blocks.

Using new materials technology methods, it is now possible to produce blocks made of aluminium.

They are available in lower nominal values in Rockwell, Brinell and Vickers scales.

Ask for our separate sales list.



TECHNICAL SPECIFICATION

All CV Instruments hardness reference block certificates are based on following international standards:

Brinell	DIN-EN-ISO 6506-3	ASTM E 10
Vickers	DIN-EN-ISO 6507-3	ASTM E 92 / E 384
Rockwell	DIN-EN-ISO 6508-3	ASTM E 18
Knoop	ISO 4545-3	ASTM E 384
Rockwell carbide	DIN 30999	ISO 3738
Martens hardness	DIN 50359	ISO DIS 14577

CV Instruments certified hardness reference blocks are available as follows and all conform to the international standards as mentioned above.

Scale	UKAS	DKD	DKD/MPA	ASTM	CV
Regular Rockwell (all scales)	Yes	Yes	Yes	Yes	Yes
Superficial Rockwell (all scales)	Yes	Yes	Yes	Yes	Yes
Brinell (all scales)	Yes	Yes	Yes	Yes	Yes
Macro Vickers (all scales)	Yes	Yes	Yes	Yes	Yes
Micro Vickers (all scales)	Yes	Yes	Yes	Yes	Yes
Knoop	Yes	Yes	Yes	Yes	
Martens hardness	Yes	Yes	Yes	Yes	

Order your blocks based on nominal values.

Please ask for our separate product list of nominal hardness values available per hardness scale and type of certificate.

CV Portable Analogue Hardness Tester - CV Instrumatic

A fully mechanical instrument of the highest precision, robust, and maintenance free. The large clearly marked dials on these unique instruments cover a full range of hardness values in Vickers, Brinell, Rockwell A, B, C, covering national and international standards.

The Instrument

The system is entirely mechanical employing the use of special pre-loaded springs which provide a load of about 15Kg to the diamond. Maximum penetration of the diamond into the specimen is 0.125mm (0.005").

Operation and Use

The simplicity of the tester enables it to be used in almost any direction, without affecting accuracy. It can be used 'on site' with complete success. The grips are depressed to the fullest extent by using the palms of the hands and the hardness value can be read off the appropriate scale. Repeatability is excellent and the calibration can be checked by the user against a UKAS certified reference test block supplied with each instrument. Each tester is supplied complete with case and detailed operating instructions.

Features

- Accurate and easy to use
- No batteries required
- UKAS certified test block supplied
- Optional bench stand with V base for round parts
- Precision Instrument
- Able to test even thin materials due to low penetration of indenter (0.25mm and above)
- Bench stand available for testing small components
- No. 3 - general purpose



PORTABLE ANALOGUE HARDNESS TESTER

Code No	Description	Scale	Range (mm)	Scale	Range (mm)	Scale	Range (mm)	Scale	Range (mm)
POR0002	No. 2	Rockwell A	40-85	Vickers Pyramid	50-100	Brinell	20-70		
POR0003	No. 3	Vickers Pyramid	100-1000	Brinell	100-400	Rockwell B	50-99	Rockwell C	20-70
POR0006	No. 6	Brinell	40-300	Vickers Pyramid	40-300				
PBS0001	Precision Bench Stand								

CV Portable Digital Hardness Tester

The Bowers CV Rangemaster Plus Hardness Tester represents an ideal solution to the problems associated with portable hardness testing. Its clear digital display, ease of use and ability to operate in all major international scales make it the most comprehensive unit of its type currently available. The optional sturdy bench stand adds further to the flexible nature of this ergonomic gauge.

RS232

Features

- Dynamic test indicator
- Large digital readout
- Hardness values in all major international scales with simple conversion facilities from one to the other
- RS232 output for connection to PC or serial printer
- Memory storage range for in excess of 400 readings
- Statistical summary
- Integral icon facility provides operator with easy visual identification of mode in which unit is operating
- Operates in temperatures from -5°C to +35°C
- Upper and lower control limits
- Last reading recall
- Supplied with two UKAS certified test blocks, adjuster key and carrying case



TECHNICAL SPECIFICATION

Hardness Scale	Vickers Pyramid No., Brinell, Rockwell B, Rockwell C, Tensile Strength, Shore Scleroscope	
Testing Range	Vickers Pyramid No.	35-1000
	Brinell	100-500
	Rockwell B	30-100
	Rockwell C	20-70
	Tensile Strength	255-1999 N/mm ²
Resolution	1	Vickers Pyramid No., Brinell, Tensile Strength, Shore Scleroscope
	0.1	Rockwell B, Rockwell C
Power	9V battery or adaptor	
Output	RS-232 serial output	

CV RANGEMASTER PLUS HARDNESS TESTER

Code No	Description
RANP001	Rangemaster
PBS0001	Precision Bench Stand
RAN0004	RS232 PC Connection Cable



Standard Delivery

- Main unit
- 2 UKAS certified test blocks
- Case
- Adjusting keys
- CV Instruments certificate
- Manual

Optional Accessories

- Bench stand
- RS-232 cable

Universal Portable Hardness Tester - TH-1100 Series

The new entry-level TH-1100 offers a very affordable but accurate hardness testing solution for on-site testing in workshops and in field operations. The unit assures accurate and reliable measurement.

Any metallic products with a minimum solid mass of 2 kg can be tested according to the Leeb principle. The display shows hardness values in all common scales, such as HLD, HB, HRC, HRA, HRB, HV and HS. The instrument is equipped with chargeable batteries that provide 16 hours continuous operation.

Features

- Direct display of hardness values in Rockwell HRB, HRC, Vickers HV, Brinell HB, Shore HS, Leebs (HLD)
- Test results appear directly on the large display
- Impact Device D integrated: no cables
- Memory up to 99 data group files
- Tests at any angle, even upside down
- High quality LCD display
- Battery Range display

TECHNICAL SPECIFICATION

Standard impact device	D integrated
Hardness scales	HLD, HB, HRC, HRA, HRB, HV, HS
Measuring range/materials	See table below
Tolerance	0.5% at 800HLD
Memory	99 data group files
Output	No
Min. surface roughness of workpiece	1.6 μ (Ra)
Max. workpiece hardness	960HLD
Min. radius of workpiece (convex/concave)	Rmin = 50mm (with support ring Rmin = 10mm)
Min. workpiece weight	2~5kg on stable support 0.05~2kg with compact coupling
Min. workpiece thickness coupled	5mm
Min. thickness of hardened layers	0.8mm
Charging time	3 hours
Continuous working time	16 hours
Power	Rechargeable Li battery
Operating temperature	0°C to 40°C
Overall dimensions	145 x 35 x 30mm
Weight	110g



TH-1100

Material	HLD	HRB	HRA	HRC	HB	HV	HS
Steel & cast steel	300-900	38.4-99.8	59.1-85.8	20-68.4	81-654	81.1-955	32.5-99.5
Cold work tool steel	300-840	-	-	20.4-67.1	-	80-898	-
Stainless steel	300-800	46.5-101.7	-	19.6-62.4	85-655	85-802	-
Grey cast iron	360-650	-	-	-	93-334	-	-
Nodular cast iron	400-660	-	-	-	131-387	-	-
Cast aluminium alloys	200-570	23.8-34.6	-	-	26.8-164	-	-
Brass	200-550	13.5-95.3	-	-	40-173	-	-
Bronze	300-700	-	-	-	60-290	-	-
Copper	200-690	-	-	-	45-315	-	-

The ranges are stipulated by the application limits of the relevant static procedure

UNIVERSAL PORTABLE TESTER - TH-1100 SERIES

Code No	Description
W-TH1100	Universal Tester

Standard Delivery

- Main unit integrated with impact device
- Test block with HLD value
- Charger
- Cleaning brush
- Certificate
- Manual
- Carrying case

Optional Accessories

- Support rings
- UKAS certified test blocks

Portable Hardness Tester - TH-170 Series



Handheld dynamic metal hardness tester with integrated Impact device D.

Features

- Impact device D integrated: no cables! (TH-170)
- Integrated impact device C featuring low impact energy for surface hardened components and thin walled components (TH-172)
- Integrated impact device DL featuring testing in confined spaces (TH-174)
- Wide measuring range
- Direct display of hardness scales Rockwell HRB, HRC, Vickers HV, Brinell HB, Shore HS, Leeb's HLD (TH-170)/Leeb's HLC (TH-172)/Leeb's HLDL
- For all metallic materials (TH-170), for steel and cast steel (TH-172/174), and cold work tool steel (TH-172)
- Provides testing at any angle
- Simple handling and low test expenditure
- High accuracy $\pm 0.5\%$
- Clear LCD display showing all functions and parameters
- Conforms to ASTM A 956 and DIN 50156
- USB output to PC only

TH-170

Material	HLD	HRC	HRB	HRA	HB	HV	HS
Steel & cast steel	300-900	20-68	39-100	59-86	81-654	81-955	32-100
Cold work tool steel	300-840	20-67	-	-	-	80-898	-
Stainless steel	300-800	20-62	46-101	-	85-655	80-802	-
Grey cast iron	360-650	-	-	-	93-334	-	-
Nodular cast iron	400-660	-	-	-	131-387	-	-
Cast aluminium alloys	200-570	-	24-34	-	27-164	-	-
Brass	200-550	-	13-95	-	40-173	-	-
Bronze	300-700	-	-	-	60-290	-	-
Copper	-	-	-	-	45-315	-	-

TH-172

Material	HLD	HB	HRC	HV	HS	HS	HS
Steel & cast steel	350-960	80-683	20-69	80-996	31-102	32-100	32-100
Cold work tool steel	350-900	-	20-68	100-941	-	-	-

TH-174

Material	HLDL	HB	HRB	HRC	HV	HS	HS
Steel & cast steel	560-950	81-646	37-100	21-68	80-950	80-96	32-100

TECHNICAL SPECIFICATION

Hardness parameter	HRC, HRB, HRA, HV, HB, HS, HLD or HLC or HLDL
Accuracy	Within ± 6 HLD (TH-170), Within ± 12 HLC (TH-172), Within ± 12 HLDL (TH-174)
Data memory	270 average data in 9 files
Output	RS-232
Min. Surface Roughness of Workpiece	1.6 μ m (Ra) (TH-170/174), 0.4 μ m (Ra) (TH-172)
Impact device	D (standard) integrated (TH-170), C integrated (TH-172) or DL integrated (TH-174)
Needle front section of DL-device (TH-174)	Diameter = 4.2mm, Length = 50mm
Workplace max. hardness value	900HLD (TH-170), 960HLC (TH-172), 950HLDL (TH-174)
Workplace radius (convex/concave)	Rmin = 50mm (with support ring Rmin = 10mm)
Workplace minimum weight	2kg-5kg on solid support (TH-170/174) 0.5kg-1.5kg on solid support (TH-172) (0.05kg-2kg with couplant paste) (TH-170/174) (0.02kg-0.5kg with couplant paste) (TH-172)
Workplace min thickness coupled	5mm (TH-170/174), 1mm (TH-172)
Workplace min. case hardened depth	0.8mm (TH-170/174), 0.2mm (TH-172)
Power	AAA Batteries (x2)
Charger	9V, 200mA (1.8VA)
Operating temperature	0°C to 40°C
Overall dimensions	155mm x 24mm x 55mm (TH-170/172) 210mm x 24mm x 55mm (TH-174)
Dimensions DL impact device (TH-174)	LxD 50mm x 4mm diameter
Weight	180g (TH-170/172) or 200g (TH-174)

PORTABLE HARDNESS TESTER - TH-170 SERIES

Code No	Description
W-TH170	Universal type
W-TH172	Low impact force (for low weight parts)
W-TH174	For narrow or confined spaces



Standard Delivery

- Main unit integrated with impact Device D, C or DL
- Test block with HLD, HLC or HLDL value
- Cleaning brush
- Battery AAA 1.5V (2pcs)
- Certificate
- Manual
- Carrying case
- Data cable (USB)

Optional Accessories

- Support rings for convex and concave surfaces
- UKAS certified test blocks
- Dataview software TH-170

Portable Hardness Tester - TH-110

The new TH-110, part of the unbeatable series of CV Leeb type dynamic hardness testers offers a very affordable but accurate hardness testing solution for on-site testing in workshops and in field operations. The unit assures accurate and reliable measurement. All results and statistics can be directly printed on the built-in printer. Any metallic products with a minimum solid mass of 2kg can be tested according to the Leeb principle and directly converted to any common hardness scale. All test results appear immediately on the display, while you toggle between scales and conversions.

Features

- Test results appear directly on the large display
- According to ASTM and DIN standard
- Display scales HV, HB, HRC, HRB, HS and conversion to tensile strength
- Highly accurate readings $\pm 0.5\%$ at 800 HL
- Correction for impact direction 360 degrees
- Chargeable battery pack to ensure many hours of undisturbed testing and printing
- Direct keys for easy set up of testing parameters
- Thermal mini-printer installed on the main unit
- Ridged ABS anti-shock casing with sealed keypad
- Optional impact devices available on request



TECHNICAL SPECIFICATION

Hardness scales	HL, HRC, HRB, HV, HB, HS
Tensile strength U.T.S range (steel only)	b from 374 to 2652
Accuracy	Within $\pm 0.5\%$ at 800HL
Printer	Thermal printer showing all test results, settings and histogram
Statistics	Average value, min-max, upper-lower limits
Impact device	D (standard)
Optional impact devices	DC/D+15/DL/G/C/E
Workpiece max. hardness value	900HLD
Workpiece radius (convex/concave)	Rmin = 50mm (with support ring Rmin = 10mm)
Min. Workpiece weight	2-5kg on stable support 0.05-2kg with compact coupling
Workpiece min. case hardened depth	0.8mm
Power	Rechargeable Li battery, 6V (1pc)
Charger	6V, 500mA (1.8VA)
Charger time	2.5-4 hours
Operating temperature	0 to 40°C
Overall dimensions	235mm x 90mm x 47mm
Weight	615gr (including impact device and printer)

PORTABLE HARDNESS TESTER TH-110

Code No	Description
W-TH110	Dynamic Hardness Tester

Standard Delivery

- Main unit with impact device type D
- Printer (on top)
- Test block with HLD-value
- Charger
- Cleaning brush
- Coupling paste
- Table support for main unit
- Certificate
- Manual
- Plastic carrying case

Optional Accessories

- Special impact devices
- UKAS certified test blocks
- Support rings for convex and concave surfaces

Portable Magnetic Rockwell Tester - W-INMR/01

Magnetic base hardness tester designed according to the principle of Rockwell hardness testing.

Features

- The test head can be fixed to the surface of iron and steel components by magnetic force. Support to the test piece is not required as the 350kg+ magnetic base will hold the unit firmly in position
- The testing accuracy complies to ISO 6508 or ASTM E18 and is comparable to a Rockwell bench hardness tester
- Testing can be done regardless of the shape of the component as long as there is a flat surface for positioning of the magnetic base
- Able to test large-size workpieces which are assembled, unable to cut or inconvenient to move such as large-size moulds, steel plates, steel tubes, steel structures, pressure vessels, metallic pipe lines or the slide ways of machine tools

Optional Accessories

- Rockwell indenters
- Rockwell balls



TECHNICAL SPECIFICATION

Initial test force	10kg
Rockwell test force	60kg, 100kg or 150kg
Indenter	120° diamond cone 1.588mm carbide ball
Force applying method	By screw
Maximum magnetic force	>350kg
Test range	Rockwell hardness HRC, HRB, HRA etc. 15 scales
Resolution	Rockwell hardness 0.5HR
Accuracy	In accordance with ISO 6508
Minimum specimen size	60mm x 180mm
Net weight	4.9kg
Package gross weight	7.4kg

PORTABLE MAGNETIC ROCKWELL TESTER

Code No	Description
W-INMR/01	Rockwell Hardness Tester

Portable Brinell Hardness Tester

The HB1500 Portable Brinell Hardness Tester is designed following the Brinell hardness test method. The test force is controlled by a shear pin. After reading the diameter of the indentation with the reading microscope, the brinell hardness number can be obtained.

Features

- Solid framework
- Easy to operate
- Tolerance is controlled by a shear pin
- Three types of application: bench, C clamp and hammer impact
- Suitable for assemblies inconvenient to be taken to the lab and not allowed to be cut
- Accuracy is much higher than any other type hammer impact tester
- Used to test the hardness of forgings, castings, steels, nonferrous metal and its alloy products, and to test the hardness of annealed, normalizing and tempered mechanical parts

TECHNICAL SPECIFICATION

Test force	1580kg
Tolerance of test force	<0.5%
Accuracy	In accordance with ISO 6506
Indenter	Ø 7.26mm steel spherical surface indenter (range: 100-400HB) Ø 4.0mm carbide spherical surface indenter (Optional) (range: 400-650HB)
Net weight	C clamp: 4.2kg Hammer impact: 0.8kg Bench: 5.1kg

PORTABLE BRINELL HARDNESS TESTER

Code No	Description
W-HB1500	Brinell Hardness Tester



Webster Type Portable Hardness Tester

The WEBSTER Hardness Testers are portable instruments that can perform on-site hardness testing on aluminium alloys, brass, copper and soft steel. A quick and easy test, the hardness value can be read out directly from the indicator with a simple clamp. Suitable for testing aluminium alloy profiles, tubings and sheet materials. Especially suitable for fast, non destructive quality inspection on the production site.

Features

- One hand operation and portability
- Variety of anvils permits testing a great variance of shapes
- Simple operation permits readings independent of the operator's skill
- Test is made by simply applying pressure to the handles until "bottom" is felt
- Easy-to-read dial indicator with 20 graduations permits use of the tester as "go" and "no-go" gauge
- Standard hardness gauge tests materials up to 13mm in thickness



WEBSTER TYPE HARDNESS TESTER

Code No	Material	Hardness Scale	Thickness	Diameter (mm)
W-WH100	Aluminium alloy	25-110HRE 58-131HV	Max. 6	Min. 10
W-WH110	Aluminium alloy	25-110HRE 58-131HV	Max. 13	Min. 10
W-WH120	Aluminium alloy	25-110HRE 58-131HV	Max. 8	Min. 6
W-WH130	Brass in hard/half hard state super-hard Aluminium alloy	63-105HRF	Max. 6	Min. 10
W-WH140	Brass in hard/half hard state super-hard Aluminium alloy	63-105HRF	Max. 8	Min. 6
W-WH150	Soft Brass, pure Copper	18-100HRE	Max. 6	Min. 10
W-WH160	Soft Brass, pure Copper	18-100HRE	Max. 8	Min. 6
W-WH170	Cold-rolled steel sheet, stainless steel	48-100HRB	Max. 8	Min. 6

TECHNICAL SPECIFICATION

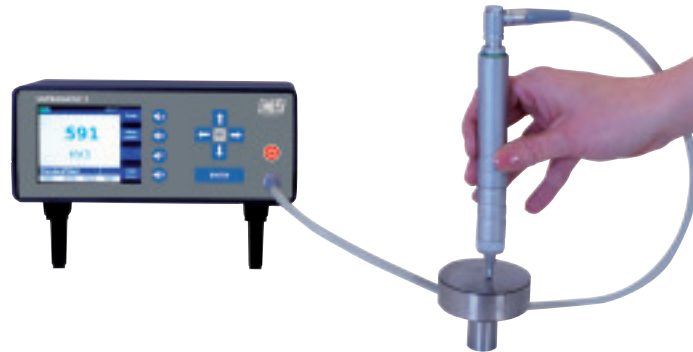
Measuring Scope	0-20HW
Accuracy	0.5HW
Net Weight	0.5kg
Package Gross Weight	1.55kg
Package Dimensions	330mm x 255mm x 150mm

Ultrasonic Portable Hardness Tester 'Ultramatic 2'

The ULTRAMATIC 2 is the next generation portable and laboratory use ultrasonic hardness tester. The instrument covers several new advanced features that can be selected from a menu-operated full colour display.

TECHNICAL SPECIFICATION

Measuring principle	UCI method (ultrasonic contact impedance principle)		
Standards	Conforms to DIN 50159, ASTM A 1038-05 and VDI/VDE directive 2616		
Indenter type	Vickers diamond (angle 136°)		
Measuring range	Vickers	HV	10-3000 (direct)
	Rockwell	HRC	20-68 (conversion)
	Brinell	HB	76-447 (conversion)
	UTS	N/mm ²	255-2180 (conversion)
Reproducibility	HV +/- 1%, HRC +/- 0.5, HB +/- 1%		
Test probes available	3N, 10N, 20N, 30N, 49N, 98N (30N standard)		
Display	Large backlit LCD, displays hardness HV, HRC, HB and UTS		
Calibration	20 preset calibrations for different materials (user definable)		
Memory	1000 readings, expandable to 30,000		
Statistics	Mean, min, max, std dev, Go-No-Go%		
Interface	Serial RS-232, RS-485 and parallel printer		
Power	Mains / rechargeable battery / shows continuous use		



PORTABLE HARDNESS TESTER - HV400

Code No	Description
W-HV400	UCI Vickers Portable Tester without probe
W-HV400/08	30N Probe (standard)
W-HV400/10	49N Probe
W-HV Guide	Guide Support

Standard Delivery

- Probe with one fixed load (30N as standard, others available)
- Charger 230V
- Certificate
- Manual
- Carrying case

Optional Accessories

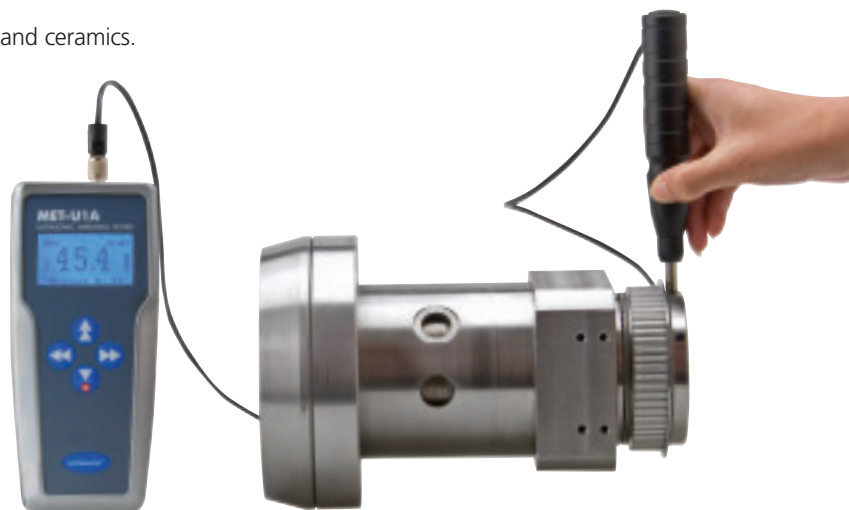
- Probe SL type (slim nose)
 - Memory for 30,000 readings
 - Bench Stand TH-4S
 - Guide Support
- Call for full specification and accessory list.

Ultrasonic Portable Hardness Tester MET-U1A

Portable hardness tester for accurate testing on metals, plastics and ceramics.

Features

- Uses UCI principle of hardness testing
- Suitable for hardness testing of metals, plastics and ceramics
- Rockwell (HRC), Brinell (HB), Vickers (HV) and Shore (HSD)
- Leaves almost no visible indent on the tested article surface



PORTABLE HARDNESS TESTER - MET-U1A

Code No	Description
W-MET-U1A	Ultrasonic Portable Hardness Tester
W-MET-U1A/10	Stand for MET-U1A probe

Standard Delivery

- Main unit
- U1 ultrasonic probe
- Power unit
- Battery: NiMH, C size
- Carrying case
- Instruments certificate
- User and installation manual

Optional Accessories

- Hardness reference test blocks
- Precision holding fixture for probe
- Battery operated grinder
- Changeable headpiece to probe
- Probe stand

CV Shore Durometers - Analogue / Digital

These advanced Shore Scale Durometers provide fast easy-to-read instruments ideal for testing rubber, plastic, leather and all other soft materials. The gauges can be used in hand held mode or mounted onto a sturdy bench stand for improved accuracy and repeatability.

Features: Analogue

- Fast and easy to read
- Portable
- Hand-held operation or via optional bench stand
- Available in either Shore A or Shore D
- Supplied with a setting / reference block
- Supplied with UKAS calibration certificate



CV SHORE DUROMETERS - ANALOGUE / DIGITAL

Code No	Description
SHA0001	Analogue Shore 'A' Scale
SHD0002	Analogue Shore 'D' Scale
DSAS001	Digital 'A' Scale Durometer, Sylvac RS232 output
DSDS001	Digital 'D' Scale Durometer, Sylvac RS232 output
SHA0003	Shore 'A/D' Bench Stand

Features: Digital

- Testing rubber, plastic, leather and all other soft materials
- Fast and easy to read
- Large digital display, digits 6mm high
- Portable
- Use by hand or mounted on a stand
- Supplied with a reference block
- Data output for SPC
- Zero setting
- Preset - value input options
- Auto display off
- Electronic module protection to IP65, even with data output
- Can be used in conjunction with Shore bench stand
- Supplied with UKAS calibration certificate



TECHNICAL SPECIFICATION - DIGITAL

Scale	Shore A	Shore D
Resolution	0.1	0.1
Standards	Conforms to ASTM D2240 and ISO 868	Conforms to ASTM D2240 and ISO 868
Display Range	0-100	0-100
Pressure foot	Ø 18mm	Ø 18mm
Indenter	Blunt taper	Sharp point
Tip angle	35°	30°
Indenter diameter	1.25mm	1.25mm
Battery	Lithium 3V, CR2032	Lithium 3V, CR2032
Data output	RS-232 combined with external power supply	RS-232 combined with external power supply

Manufactured in accordance with specifications, ASTM D2240 and ISO 868. For all flexible materials i.e. rubber, leather, vinyl sheets, perspex and plastics using the Shore 'A' and 'D' Scales.

The bench stand is intended for use with 1Kg. loading for Shore 'A' scales and 5Kg. for Shore 'D' scales. Using the stand ensures a greater repeatability and better accuracy.

Surface Roughness Standards

Ideal for use in the drafting room, engineering department or small shop.

Features

- Made from solid electroformed nickel
- Markings in AA (microinches) and metric in Ra (micrometers)
- Each type of surface finish is truly and consistently reproduced to give the operator a realistic idea of the feel, appearance and texture of the machined component
- Conforms to S.A.E. and military specifications for visual and tactile inspection
- Set contains 30 Specimens, each 7/8" x 3/8"



SURFACE ROUGHNESS STANDARDS

Code No	Description
10-7524	3 Specimens Flat Lapping 2, 4 and 8 μ " AA 3 Specimens Reaming 16, 32 and 63 μ " AA 6 Specimens Grinding 2, 4, 8, 16, 32 and 63 μ " AA 6 Specimens Horizontal Milling 16, 32, 63, 125, 250 and 500 μ " AA 6 Specimens Vertical Milling 16, 32, 63, 125, 250 and 500 μ " AA 6 Specimens Turning 16, 32, 63, 125, 250 and 500 μ " AA

Moore & Wright Surface Roughness Tester - MTR110

The Surfmatic MTR110 is a pocket sized surface roughness measuring instrument ideally suited to rapid on-the-spot surface measurements. Conforms to ISO Class 3.

Features

- Back-light LCD
- Dynamic Test Display: progress of cut-off length during testing
- Li-ion rechargeable batteries
- Protection slide on pick-up
- Auto-off after 90 seconds
- Pocket-size and economically priced
- Both Ra and Rz parameters in one instrument
- Features external calibration specimen
- Large measuring range suitable for most materials
- Piezo-electric pick-up stylus for external surfaces
- Includes steel test piece
- Includes charger unit
- Measurements of shafts above 40mm diameter using the Vee groove in base



SURFACE ROUGHNESS TESTER

Code No	Description
MTR-110UK	Surface Roughness Tester

Please visit www.bowers.co.uk for full technical specification.



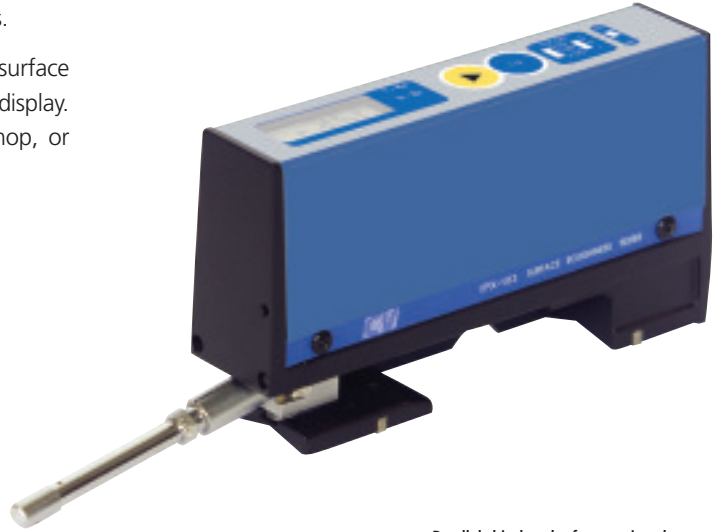
Surface Roughness Tester - R-135

Handheld surface roughness tester for external surfaces and grooves.

The R-135 is a portable, battery-powered instrument for checking surface roughness, with the measured values displayed on a digital readout display. The instrument can be used in laboratory, inspection area, workshop, or wherever on-site surface roughness testing is required.

Features

- Pocket-sized and economically priced!
- External and internal finish testing with swivable tracer
- Ra and Rz parameters in one instrument and all available after each individual test
- Standard 9V battery (not included)
- Three cut-off 0.25mm, 0.8mm and 2.5mm, adjustable to 1-3-5 times
- Pi'zo-electric pick-up stylus for external surfaces with diamond tip of 2 micron according to the latest ISO standards
- With data output



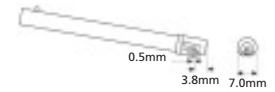
TECHNICAL SPECIFICATION

Measuring ranges	Ra-- 0.03µm ~ 6.35µm (1µ"~250µ")
Rz-- 0.2µm ~ 25.3µm (8µ"~999µ")	
Display resolution	0.01µm / 1µ"
Cut-off	0.25mm / 0.001", 2RC filter, select 1-3-5 times 0.8mm / 0.03", 2RC filter, select 1-3-5 times 2.5mm / 0.01", 2RC filter, select 2 times
Display	3-digit LCD
Accuracy	Meets ISO and DIN standards
Probe Type	Piezoelectric
Maximum stylus force	15.0mN / 1500mgf
Stylus tip radius	Diamond, 2 micron
Power	9V alkaline battery (not included)
Battery capacity	Approx. 3000 measurements
Output	RS-232 to pc or printer (only IPX-104)

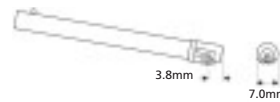
CV SURFACE ROUGHNESS TESTER

Code No	Description
W-R135	Surface Roughness Tester + RS-232 output
W-R130/3200	Stand for R-135
W-R130/4101	Data cable to PC or Printer

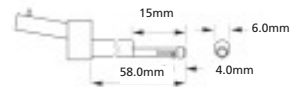
Parallel chisel probe for gauging sharp edges or small O.D., perpendicular for axis of traverse



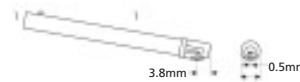
Standard probe for most applications



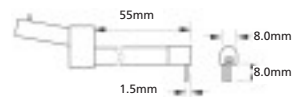
Small bore probe, minimum inside diameter 5.0mm, up to depth of 15.0mm



Transverse chisel probe for gauging sharp edges or small O.D., aligned to axis of traverse



Groove bottom probe for measuring the bottoms of O-ring grooves, recesses and holes up to 8.0mm depth

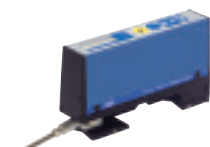


Standard Delivery

- Main unit
- Protection cover
- Roughness test plate Ra
- Carrying case
- Manual
- RS-232
- Certificate

Optional Accessories

- Tracers for special applications
- Stand for stable testing
- Mini-printer with cable
- Data cable to MS-Hyperterminal



CV Surface Roughness Tester - TR-200

The comprehensive, hand-held TR-200 represents the ideal multi-function solution for surface roughness testing. This compact gauge has a large measuring range, easy-to-read, backlit graphical and text display and is suitable for a wide variety of applications.



DataView PC Software

TECHNICAL SPECIFICATION

Roughness parameter	Ra, Rz, Ry, Rq, Rt, Rp, Rmax, Rv, Rs, Rsm, Rsk, Rmr
Assessed profiles	Primary profile (P), Roughness profile (R) Tp curve (material ratio Mr)
Profile recording magnification	Vv: 200x - 20000x Vh: 20x, 50x, 200x
Standard	Conforms ISO / DIN / JIS / ANSI (menu selectable)
Measuring system	Metric μm , imperial μinch
Display resolution	0.001 μm / 0.04 μinch
Display features	Detector stylus position indicator Battery level indicator, Direct printing, Direct display of parameters and profiles
Data output	RS-232 port
Measuring range	Ra, Rq : 0.0-40.0 μm Rz, Ry, Rp, Rt, R3z, : 0.02-160 μm Sm, S : 2-4000 μm Tp : 1-100% (% Ry)
Cut-off lengths	0.25mm / 0.8mm / 2.5mm
Evaluation length Ln	1-5 cut-off

Standard Delivery

- Certificate
- Main unit, Stylus TS100
- Protection nose piece
- Steel support for stand alone use
- Roughness test plate Ra
- Charger
- Carrying case

Optional Accessories

A large range of accessories are available including TA220 printer, pickups/ extensions, measuring platform, PC software.

CV SURFACE ROUGHNESS TESTER

Code No	Description
W-TR200	TR-200 Surface Roughness Tester
W-TA-220	Printer for TR200
W-TS-100	Tracer, standard
W-TS-110	Tracer, narrow skid, special
W-TS-120	Tracer, with skid, bores from 2mm
W-TSEA	Extension arm, 50mm x 10mm
W-TS-130	Tracer, deep grooves <3mm
W-TS-131	Tracer, deep grooves <10mm
W-TSEB	Extension arm, 90°, 70mm x 25mm
W-200/0320	DataView Software - Windows XP
W-200/0500	Granite platform TA610 without 'L' attachment
W-200/0510	'L' attachment for TR200

W-TS-100



W-TSEA



W-TSEB



Diavite DH8 High Precision Surface Roughness Meter



New high precision surface roughness meter for universal use in workshops and inspection rooms. VH model for use with probes with skids only. VHF model for use with probes with and without skids.

Features

- Automatic calibration
- Memory for 50 measurements
- 5 measuring lengths, all selectable between 0.5 and 15.0mm
- Selectable measuring speed
- Calibration for max. 8 tracers
- 8 measuring programs
- Choice of many types of tracers to solve nearly all measuring tasks, also customer specific ones
- User friendly comprehensive multilingual menu guidance
- Tolerance indication for measuring values exceeding permissible allowance set
- Key lock for It, Ic and R to prevent any settings being changed by mistake during measuring procedure
- USB output for data transfer (Option: Bluetooth)
- Choice of capable software programmes DIASOFT (optional)
- Numerous accessories for many applications, needed for working with skid less tracers
- Rechargeable battery for mobile applications



DIAVITE DH8 HIGH PRECISION SURFACE ROUGHNESS METER

Code No	Description
13-3053	Diavite DH8 Surface finish tester VH
13-3051	Diavite DH8 Surface finish tester VHF
13-3074	Stand with alu base
13-3074HG	Stand with black granite base
13-3052/A	Motor nose piece clamp
13-3030	Extension - 100mm

Diavite Tracers

The flexible application of a surface roughness meter can be reached using a Diavite tracer, of which there are several to choose from. For DH-8 and COMPACT II, 17 different tracers are available, and thanks to the integrated reference flat in the VHF traversing unit, very precise measurements are no longer a problem - even using skid-less tracers.



TRACER WITH SKID

Standard tracer

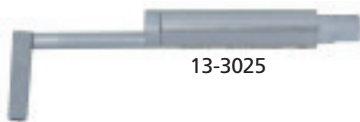
SH
Smallest bore: \varnothing 8mm
Max. measuring depth: 27mm
Included in the delivery



13-3022

Slot tracer

NH
Max. depth of slot: 15mm and 20mm
Min. width of slot: 3mm



13-3025

Concave-convex tracer

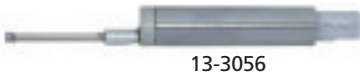
KKH
For measuring concave and convex work pieces having a minimum radius of 5mm. Also irregular curves can be measured. Use minimum cut-off and length of traverse.



13-3058

Bore tracer

BH
Smallest bore: \varnothing 2.5mm
Max. measuring depth: 20mm



13-3056

Axis and knives tracer

AH
For measuring small axis, knives, edges and wires.



13-3054

Gear tooth flanks tracer

ZH
Tracer with skid for tooth flanks up to module 2.

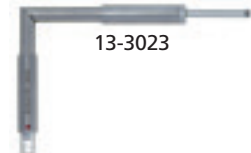


13-3028

TRACER WITH SKID CONTINUATION

Transversal tracer

QH
For use in slots and for crank shaft.



13-3023

Transversal tracer

QKKH
For measuring radially slots in bores and tubes.



13-3024

Circumference and ball tracer

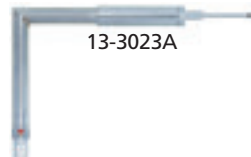
UH
Minimum possible diameter \varnothing 8mm.



13-3027

Transversal tracer

QBH
For measuring radially in bores and tubes.



13-3023A

Basis tracer

TH
For measuring of deep level flats till 140mm.



13-3066

SKIDLESS TRACER

Bore tracer

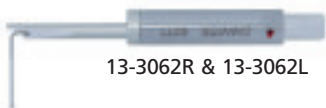
BZFH
Smallest bore: \varnothing 1.5mm
Max. measuring depth: 15mm
Gear tooth flanks: from module 0.75



13-3060

Transversal tracer

WFH
For measuring slots inside of flanks.



13-3062R & 13-3062L

Slot tracer

NFH
Max. depth of slot: 25mm
Min. width of slot: 1.5mm



13-3068

Small bore tracer

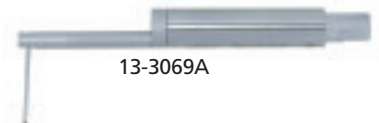
BZFH-06
Smallest bore: \varnothing 0.8mm
Max. measuring depth: 15mm
Gear tooth flanks: from module 0.5



13-3067

Slot tracer

NFH-06
Max. depth of slot: 10mm
Min. width of slot: 1.0mm



13-3069A

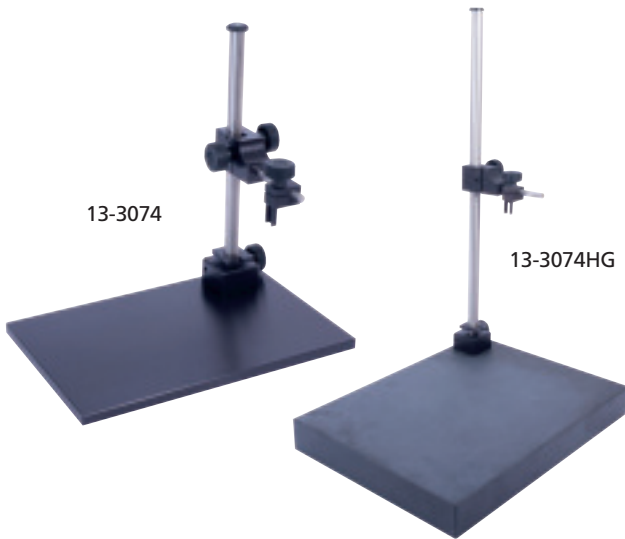
Axis and knives tracer

AFH
For measuring small axis, knives, edges and wires.



13-3063

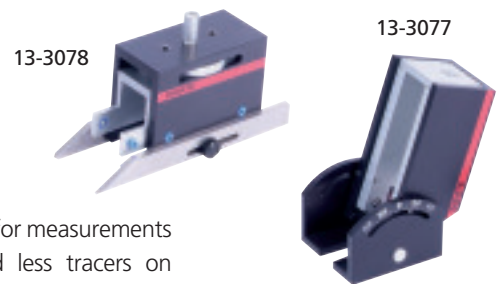
Diavite Accessories & Applications



Measuring support with alu- or granite base plate and column 250mm or 500mm high.



"Tubemaster" for measuring the roughness radially at the inner and outer circumference of tubes and cylindrical parts.



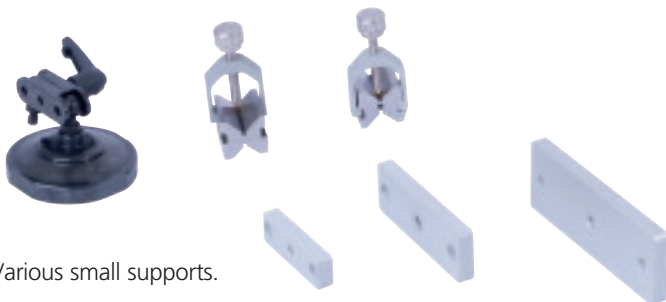
Adapter for measurements with skid less tracers on big work pieces.



Cross table 70 x 70mm for vices.



Vices with jaws width 15mm, 25mm and 35mm.



Various small supports.



Various metal or glass specimen.



Device for the manual measurement of crank shafts (without tracer and motor unit).



13-3030

To extend the tracers for deep bores (up to 700mm), (standard 100mm).

CV Ultrasonic Thickness Gauge - TT-100 Series

The TT series represents a range of quality, hand-held, ultrasonic gauges for accurate measurement of wall thickness of a variety of materials, displaying results on a clear digital display. Suitable for metals, glass and plastics.

Features

- Easy to operate ultrasonic wall thickness gauge
- Standard 5 MHz transducer included, special purpose types available
- Clear 4-Digit LCD display
- Retention of last 10 readings



TECHNICAL SPECIFICATION

Four models:	TT-100, TT-110, TT-120, TT-130
Measuring range	4.0-80.00mm with ZW5P transducer (TT-120)
Measuring range (in steel)	1.2-225.0mm with 5MHz transducer (TT-100, TT-110, TT-130)
Measuring restriction	Minimum 3mm thickness, 20mm dia
Transducer frequency	Standard 5 MHz, diameter probe 10mm
Display resolution	0.1mm (0.01mm for model TT-130)
Measuring accuracy	+/- 0.1mm (+/- 0.02mm for model TT-130)
Measuring units	mm
Sound velocity range	1000-9999m/s (5900m/s for TT-110, steel only)
Working temperature	All standard -15°C to + 150°C, Model TT120 up to 300/4C max

Applications:

TT-100 for metal, glass, plastics etc (Standard model)
TT-110 for steel thickness only
TT-120 for high temperature steel (Up to 300°C)
TT-130 for metals, glass, plastics etc, 0.01mm resolution

ULTRASONIC THICKNESS GAUGE - TT-100

Code No	Description
W-TT100	Universal / 0.1mm reading / incl. transducers (5MHz)
W-TT110	Steel only / 0.1mm reading / incl. transducers (5MHz)
W-TT120	High temp., reading 0.1mm / incl. special transducer
W-TT130	Universal / 0.01mm reading / incl. transducer (5MHz)

Standard Delivery

- Transducer 5MHz
- Transducer ZW5P (TT-120)
- Integrated steel calibration plate 4.0mm
- Ultrasonic couplant
- Operation manual
- Carrying case

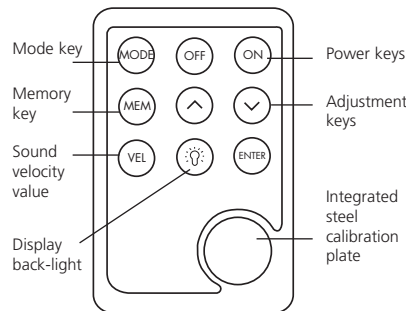
CV Ultrasonic Thickness Gauge - TT-300 Series

Handheld gauge with external transducer series for metals, glass and plastics.



Features

- Four models available
- Easy to operate ultrasonic wall thickness gauge for metals, glass, plastics
- Display resolution menu selectable
- Automatic zero setting
- Two-point calibration possible
- LCD display with back-light
- Min. mode for minimum thickness measurement
- Mm/inch selectable
- Data output RS-232
- Large internal memory for 500 readings
- Including protection case, couplant and carrying case



TECHNICAL SPECIFICATION

Measuring range	1.2-225.0mm (steel) with 5MHz transducer 5.0-80.0mm (steel-high temp (300°C)) 5MHz transducer 5.0-40.0mm (cast iron) 2MHz probe
Transducer frequency	Standard 5 MHz, diameter probe 10mm
Display resolution	Menu selectable, low 0.1mm, high 0.01mm
Measurement accuracy	0.75-9.99mm: ±0.05mm 10-99.99mm: (0.5%H+0.01)mm 100mm - 300mm: (1%H+0.1)mm
Measuring units	mm/inch selectable
Sound velocity range	1000-9999m/s
Display	LCD with back-light
Display Min. mode	Display current thickness or minimum thickness (menu selectable)
Alarm function	Minimum / Maximum limits exceeding alarm
Calibration setting	Automatic zero setting, two-point calibration possible
Data output	RS-232 serial port, Baud rate selectable to printer or pc
Memory	Storage of 500 thickness readings
Surface temperature	Standard -10°C to +60°C (high temperature see TT-320)
Battery indicator	Low battery indicator
Power supply	2 pcs AA batteries 1.5V
Operation time	With back-light 60 hours continuously Without back-light 100 hours continuously
Dimensions	152 x 74 x 35mm
Weight	370g



Standard Delivery

- Main unit
- Integrated steel calibration plate
- Transducer 5MHz
- Transducer ZW5P (TT-320)
- Batteries AA 1.5V (2 pcs)
- Ultrasonic couplant
- Manual
- Certificate
- Carrying case

Optional Accessories

- Transducers for special applications
- TA-220 printer with cable
- Software Dataview TT-300



ULTRASONIC THICKNESS GAUGE - TT-300

Code No	Description
W-TT300	Universal, 0.01mm resolution, 5MHz probe (std)
W-TT310	Universal, 0.10mm resolution, 5MHz
W-TT320	High temperature version, (300°C) 5MHz probe
W-TT340	Castings version, 2MHz probe

Coating Thickness Gauge - TT-210



Features

- Easy to use
- Integrated probe FN
- Automatic substrate recognition
- Automatic calculation: Mean/Max/Min/No./S.Dev
- Upper-lower limit setting and sound alarm
- Data output RS-232 to printer TA-220S or PC
- Storage function for 500 measuring results
- Measurement modes: continuous/single
- Battery operated



TECHNICAL SPECIFICATION

Operating principle	Magnetic induction/eddy current
Measurement range	0μm to 1250μm
Measuring system	Selectable mm/inch
Minimum resolution	0.1μm (coating thickness <100μm)
Measuring accuracy	F: ±(3%H+1μm) N: ±(3%H+1.5μm) H = nominal value
Statistics	Average (MEAN), MAX., MIN., number of measurements (NO.), standard deviation (S.Dev)
Power supply	Battery AAA 1.5V (2 pcs)
Display	LCD with back-light
Dimensions	110mm x 50mm x 23mm
Weight	100gr

COATING THICKNESS GAUGE - TT-210 SERIES

Code No	Description
W-TT210	Handheld gauge with integrated FN probe

Standard Delivery

- Calibration foil set
- AAA 1.5V battery (2 pcs)
- Manual
- Certificate
- Carrying case

Optional Accessories

- Printer TA-220S with cable

Coating Thickness Gauge TT-270 Series

The measuring methods of the TT-270 are magnetic induction (F) and eddy current (N). When a F series probe is connected, the unit measures non-magnetic coating on ferro substrates, when a N series probe is connected, the unit measures non-conductive coating on non-ferro substrates.

Features

- Several types of probes are available for various applications: F400, F1, F1/90, F10, N1, CN02
- Measurement modes: continuous / single
- Automatic calculation: Mean values / Max. values / Min. values / No. of test, S.Dev.
- Memory for maximum 640 readings
- Working modes: direct mode (DIRECT) and Batch mode (APPL)
- With backlight display
- Integrated printer
- Battery low indication
- Switch off modes: manual and auto



TECHNICAL SPECIFICATION

Measuring range	Refer to table below
Probes available	F400, F1, F1/90, F10, N1, CN02
Tolerance	Refer to table below
Minimum resolution	Refer to table below
Measuring conditions	Refer to table below
Operation language	English
Standards	DIN, ISO, ASTM, BS
Min. measuring area	Ø5mm (standard probe N1), Ø7mm (standard probe F1)
Calibration	Zero and foil calibration
Statistics	Maximum and minimum, mean, standard deviation of 3000 readings, number of measurements
Data memory	640 readings
Limits	Min-max with alarm
Interface	RS-232
Operating temperature	-5°C-40°C
Humidity	20%~90%
Power supply	NiMH rechargeable batteries, 1.25V
Dimensions	230mm x 86mm x 47mm
Weight	530g

Standard Delivery

- Controller unit & integrated printer
- Probe F1 or N1
- Charger
- Substrate & calibration foil set
- Printer paper
- Manual
- Quality certificate

Optional Accessories

- Various probes for different applications

PROBE MODEL

	F400	F1	F1/90°	F10	N1	CN02
Operating principle	Magnetic induction	Magnetic induction	Magnetic induction	Magnetic induction	Eddy current	Eddy current
Measuring range (µm)	0-400	0-1250	0-10000 10-200 (for chrome plate on copper)	0-1250	0-40	
Low range resolution (µm)	0.1	0.1	0.1	10	0.1	1
Accuracy One-point calibration (µm)	±(3%H+1)	±(3%H+1)	±(3%H+1)	±(3%H+10)	±(3%H+1.5)	±(3%H+1)
Accuracy Two-point calibration (µm)	±[(1~3)H%+0.7]	±[(1~3)H%+1]	±[(1~3)H%+1]	±[(1~3)H%+10]	±[(1~3)H%+1.5]	-
Measuring conditions	Convex 1	1.5	Flatten	10	3	Flatten
Min curvature of the min area (mm)						
Min diameter of the area (mm)	Ø 3	Ø 7	Ø 7	Ø 40	Ø 5	Ø 7
Critical thickness of substrate (mm)	0.2	0.5	0.5	2	0.3	unlimited

COATING THICKNESS GAUGE - TT-270 SERIES

Code No	Description
W-TT270F	Coating thickness gauge with integrated printer and F1 probe
W-TT270N	Coating thickness gauge with integrated printer and N1 probe
W-TT270FN	Coating thickness gauge with integrated printer and FN probe

Ultrasonic Thickness Gauge TT-500

The new handheld TT-500 Ultrasonic Wall Thickness Gauge offers the ability to measure the wall thickness through paint and eliminate coatings. It assures accurate measuring of wall thickness and the extent of corrosion of all metals from the outside.

Features

- A-Scan display for waveform verification
- Wide thickness range (0.75-508mm)
- Echo-echo mode to determine the distance excluding the coating between two echoes
- Min. and Max. mode
- Two Differential modes:
 - Thickness difference between actual measuring and reference value
 - % difference between actual measuring and reference value
- Manual gain adjustment/auto gain selectable
- Large backlit LCD display



TECHNICAL SPECIFICATION

Measuring range	0.75mm - 508.00mm
Sound speed	1000m/s - 9999m/s
Scanning mode	A scan
Gain range	20db - 70db step: 1db
Rectification	Positive half wave, negative wave, full wave, and RF
Testing mode	Standard mode: testing from primary pulse to the first echo. Testing between two echoes
Resolution	Standard: 0.01 low: 0.1
Memory	100 A scan graphs and 10000 thickness values in 100 groups
Communication	RS-232 port to PC or printer
Tolerance (steel)	A) When the selected resolution is 0.01mm and the thickness is $H < 10\text{mm}$, the tolerance is = 0.05mm maximum B) When the resolution is 0.01mm and the thickness $H > 10\text{mm}$, the tolerance is = (0.5% H 0.01mm) maximum C) When the resolution is 0.1mm the tolerance is = (1% H 0.1mm) maximum
Pulse frequency	1KHz
Protection Class	IP54

ULTRASONIC THICKNESS GAUGE TT-500

Code No	Description
W-TT-500	TT-500 Coating wall thickness gauge

Multi-Functional Digital Force Gauge

With integrated load cell and external load cell.

Features

- High accuracy +/- 0.5% of full scale
- Peak hold function
- Tolerance setting
- Calculation of average values
- Lbf, kgf and Newton units
- RS232 digital output
- Clear LCD display showing all functions and parameters
- Supplied with standard accessories and software
- Optional stands available



13-03650



13-03652



TECHNICAL SPECIFICATION

Measurement unit	Lbf, kgf or Newtons
Accuracy	+/-0.5% of full scale
Resolution	Depending on range, see table below
Output	RS232
Memory	10 readings to calculate average
Power	Rechargeable Ni-Hi batteries
Battery life	20 hours of use
Operating temperature	20°C +/- 10°C
Dimensions	225mm x 65mm x 35mm
Weight of main unit	650g

DIGITAL PUSH-PULL FORCE GAUGE

Code No	Description	Maximum Scale Newtons	Minimum Scale Newtons
13-03611	SH-2	2	0.001
13-03612	SH-5	5	0.001
13-03613	SH-10	10	0.005
13-03614	SH-20	20	0.01
13-03615	SH-50	50	0.01
13-03616	SH-100	100	0.05
13-03617	SH-200	200	0.1
13-03618	SH-500	500	0.1
13-03650	Stand (Mechanical)		
13-03652	Stand (Motorised)		

STANDS SPECIFICATION

13-03650	
Dimension	152x233x425 (LxWxH)
Weight	10.6Kg
Capacity	500N
Stroke	70mm

13-03652	
Dimension	245x430x570 (LxWxH)
Weight	24.2Kg
Test speed: 50-245mm/min	Capacity: 200N
Test speed: 200-500mm/min	Capacity: 500N
Stroke	250mm
Accuracy of speed	10%
Resolution of speed	5 mm/min
Max Cycle Times	9999

Standard Delivery

- Main unit
- AC adaptor
- 5 measuring tips
- 4 M3 x 8 mounting screws
- CD-ROM with PC software
- Extension shaft
- Inspex certificate
- Instruction manual

Optional Accessories

- Various stands
- UKAS calibration certificate
- RS232 serial cable