



SERIE 251 VRS

251 VRSA

251 VRSD

251 VRSTV

Universal hardness testers

Rockwell, Superficial Rockwell, Brinell, Vickers, Knoop, Shore

251 VRS

MOTORIZED MEASURING HEAD

The measuring head of the VRS hardness testers family is a fully motorized system for automatic preloading, loading and measurements. VRS AFFRI® System hardness testers achieve the highest level of depth accuracy and measurement resolution available for Rockwell tests. Thanks to the AFFRI® System, the real indentation measurement is guaranteed without any external interference in any condition.

ONE BUTTON MEASUREMENTS

Just push the start button and the head moves down performing the hardness test cycle in automatic succession without breaching a phase:

- 1. Automatic contact with the specimen
- 2. Automatic clamping and activation of the reference surface point
- 3. Automatic preloading and loading
- 4. Automatic measure
- 5. Automatic return stroke at programmed distance

The entire test cycle is complete and the result appears on a large display.



Fully motorized and automatic, the test is not affected by operator influences and can be easily used by operators of every level.



LOAD FORCE RANGE

9.807	29.42	49.03	61.29	98.07	147.1	153.2	196	245.2	294.2	306.5	441.3	490.35	588.4	612.9	980.7	1226	1471	1839	2452	N
1	3	5	6.25	10	15	15.6	20	25	30	31.2	45	50	60	62.5	100	125	150	187.5	250	kgf

ROCKWELL TESTS - DIN EN ISO 6508 / ASTM E-18

HRA	HRB	HRC	HRD	HRE	HRF	HRG	HRH	HRK	HRL	HRM	HRP	HRR	HRS	HRV	HR15 N/T/S/W/X/Y	HR30 N/T/S/W/X/Y	HR45 N/T/S/W/X/Y
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BRINELL HBWT TESTS - DIN EN ISO 6506 / ASTM E-10

1/30	2.5/15.6	2.5/31.5	2.5/62.5	2.5/187.5	5/125
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BRINELL HBW TESTS - DIN EN ISO 6506 / ASTM E-10

1/10	1/30	2.5/6.25	2.5/15.625	2.5/31.25	2.5/62.5	2.5/187.5	5/25	5/125	5/250
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VICKERS TESTS - DIN EN ISO 6507 / ASTM E-384

HV1	HV3	HV5	HV10	HV15	HV20	HV30	HV60	HV100
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SHORE A/D (Optional) Plastic and rubber EN-ISO 2039: 49 - 132 - 358 - 961 N

TEMPERATURE: Measure test temperature range from - 40.0 to + 80.0 °C

SELF-ALIGNING OPTICAL ARM

Automatic system for Brinell and Vickers measurements with indentation reading in compliance with ISO 6506 6507 and ASTM E384 E10 standards. Rotating optical arm with self-alignment of the optic with the indentation axis. Automatic centering with no need to move the specimen after the indentation. Interchangeable objectives (magnifications): 1x 2x 3x 4x for 5x 10x 15x 20x and 15x eyepiece for manual measure. (Total magnification: 75x 150x 225x 300x).



251 VRSTV



Automatic

Automatic and semi-automatic reading through CCD camera and combined software for indentation evaluation and measurement.

251 VRSD



Semi-automatic

Reading with encoder and direct digital readout. Just spin the right wheel to adjust reference lines and push the "auto-read" button.

251 VRSA



Digital

Reading with drum scale and digital measure. No need to use tables.



251 VRS

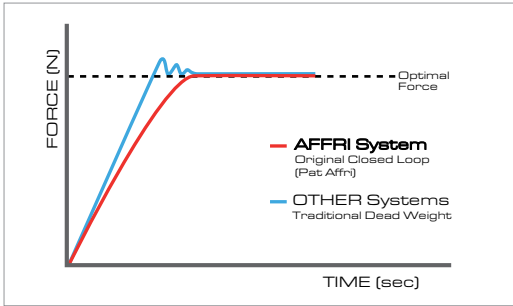
LOAD CELL AND CLOSED LOOP TECHNOLOGY

Load forces are applied through load cells and electronically controlled in "Closed Loop" (Pat. AFFRI) with a frequency of 1 khz. Each load force is automatically programmed and controlled assuring perfect linearity in every range eliminating the problems associated with traditional dead weight system testers. Results are not affected by any structural deflection, misalignment and external vibrations.

Accurate measurements, even on the first test, eliminate the need for multiple tests. There is no need to repeat for a second test, the first one is absolutely precise. The R&R (repeatability and reproducibility) data is at the top of its class.

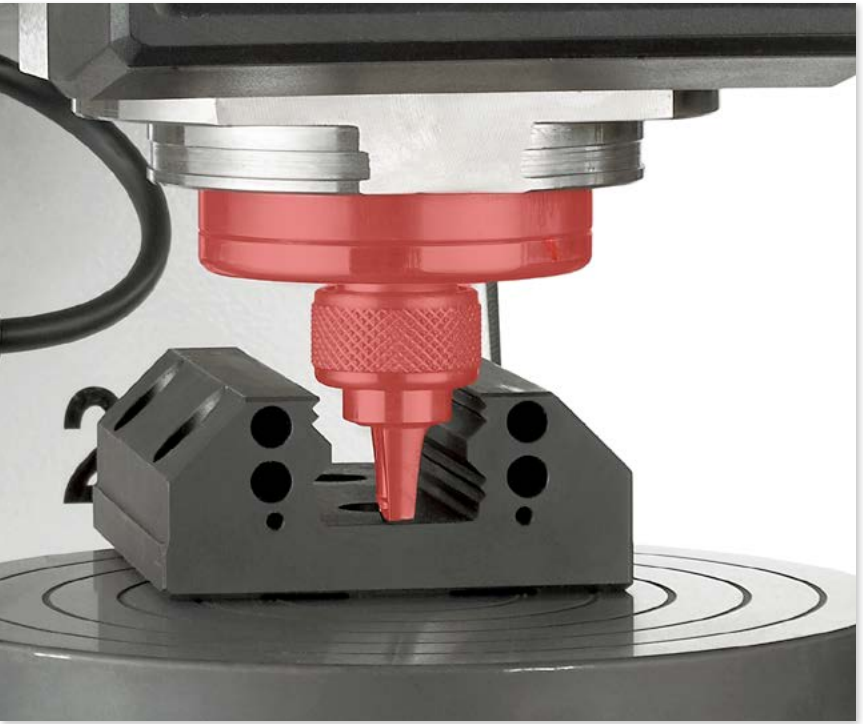


THE FIRST TEST RESULT IS CORRECT AND ABSOLUTE



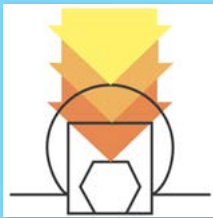
CLAMPING SYSTEM

Secure contact with the specimen is always maintained, even in the unlikely event of any specimen movement during the operation cycle. The clamping system assures perfect stability of any test piece throughout the test cycle, even if it's oily, greasy, rusty or dirty.



MOTORIZED STROKE

When testing unstable samples or deflecting parts, the AFFRI System will follow the sample without losing contact thanks to its 50 mm stroke for indenter and clamping hood. Easy and fast hardness measurements on pieces with different thicknesses without acting on the tester head or elevating screw.



THE 251VRS AFFRI HARDNESS TESTER IS EQUIPPED WITH A MOTORIZED VERTICAL STROKE WHICH MOVES THE INDENTER AND THE CLAMPING HOOD BY 50 mm:

The motorized vertical stroke drives the measuring system to make automatic contact with the specimen and blocks it. The constant pressure compensates any sample deflection or settling before and during the indentation measuring process.

251 VRS



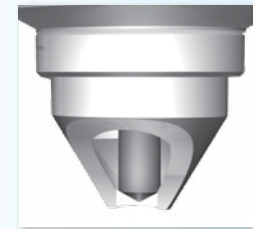
X/Y TABLE

Manual XY table 100x100 mm with 10 µm step. This table is a perfect solution for multi indentation test cycles. The table allows manual CHD case depth tests and can be provided with digital micrometers for automatic CHD graph generation.



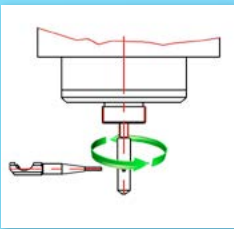
WORKING BASE

Vertically sliding chromed work table capable of bearing masses up to 2000 kg which allows for steady hardness measurements on bulky or irregular pieces. It is possible to install different types of pieceholder anvils: from large plane tables to V shaped anvils or special solutions for irregular specimens.



PROTECTED INDENTER

The exclusive Affri diamond indenter has a longer life-span than any other indenter on the market. The indenter retracts and moves down just after the test piece is clamped thereby minimizing the risk to accidental shocks. Screw-unscrew system for indenter changing.



L.I.S.A - Laser Indicator System Affri (Patented)

Exclusive application which allows ultra-precise test positioning. The laser pointing system helps to define the indentation area before the contact between the indenter and the specimen. Reach extreme points with lack of illumination, edges of gear's teeth or sides of cutting tools and blades. (This application is optional)



LED LIGHT

Adjustable LED light source for a clear view of the test zone on any surface or specimen shape. Illuminate extreme points where lighting is low like sample holes and dark layers. The adjustable arm of the light can be bent in any direction allowing illumination outside of the testing area. (LED light is optional)

DIGITAL DISPLAY AND SOFTWARE

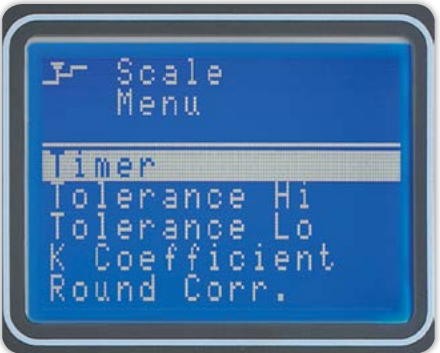
Main LCD control panel in front of the measuring head for setting up the test parameters, including powerful software and electronic:

- **Large LCD and lots of functions:** Simultaneous view of 2 scales, the one of the test and the one chosen from the list of conversion scales. Conversion values for all hardness scales HR, HB, HV, HSD, HK, HRN, HRT, N/mm.
- **Precise test settings:** Check load is applied correctly. Select dwell time. Calibration by direct and indirect method conform to ASTM E 18 ISO 6508.
- **Dynamic results:** Simultaneous view of the range of results for statistics. Results average updated at the last measure. Statistic CP CPX CX Histogram and number of tests corresponding to tolerance values (Lo, Hi, OK). Create 10 file record data with 350 measures each.
- **Unique performances:** Temperature measure in C° usefull for certification tests according to ASTM E 18 ISO 6508. Depth of indentation in 0,01 microns. Acoustic signal for dwell time and for preload. Printer connection output RS 232C or USB. Back light LCD display 128 x 64 pixels. Touch key pad board IP 64 protection. Powered by rechargeable battery for 100% portability of the hardness tester (OPTION).

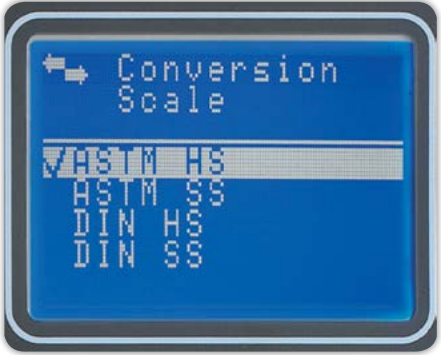
VRS serie hardness testers can easily be used by operators of every level. The test cycle is fully electronically controlled.



Set of the hardness test methods



Measurement settings



Conversion scales tables



Results with average and conversion



Storable and printable statistics



Intuitive keyboard with direct commands.



ACCESSORIES

Affri provides a large variety of accessories to fulfil any purpose of test. Customized solution based on client needs can be made for perfect tests on rough pieces. A series of different anvils is available to test every size of test piece. Variety of accessories to facilitate testing on small or oddly shaped items. Large variety of high quality indenters with certificate. Ball, cone, tungsten or diamond indenters for each hardness scale Rockwell, Vickers, Brinell, Knoop and Shore. Test blocks for hardness tester periodic calibration with UKAS/ACCREDIA certificate, for any hardness scale and value.

All AFFRI's accessories are customizable according to customers specifications, depending on dimensions and geometry of the samples and finished products.



REAL TIME SUPPORT

Real Time Support. Connect your 251 VRS to Internet, so that we can remotely diagnose any technical issue, provide additional operator training and update software version.

Connect to www.affri.com for more details.

FORCE RANGE

Preload:	29.42 - 98.07 N (3 - 10 kgf)
Rockwell:	588.4 - 980.7 - 1471 N (60 - 100 - 150 kgf)
Superficial Rockwell:	147.1 - 294.2 - 441.3 N (15 - 30 - 45 kgf)
Brinell:	9.807 - 49.03 - 61.29 - 98.07 - 153.2 - 245.2 - 294.2 - 306.5 - 612.9 - 1226 - 1839 N (as option 2452 N) (1 - 5 - 6.25 - 10 - 15.6 - 25 - 30 - 31.2 - 62.5 - 125 - 187.5 kgf - as option 250 kgf)
Vickers/Knoop:	9.807 - 29.42 - 49.03 - 98.07 - 147.1 - 196 - 294.2 - 490.35 - 980.7 N (1 - 3 - 5 - 10 - 15 - 20 - 30 - 50 - 100 kgf)
Optional tests:	49 - 132 - 358 - 961 N (for plastic and rubber as per EN-ISO 2039)

FEASIBLE TESTS

Rockwell:	HRA - HRB - HRC - HRD - HRE - HRF - HRG - HRH - HRL - HRM - HRP - HRR - HRS - HRV
Superficial Rockwell:	HR15N - HR30N - HR45N - HR15T - HR30T - HR45T - HR15S - HR30S - HR45S - HR15W - HR30W - HR45W - HR15X - HR30X - HR45X - HR15Y - HR30Y - HR45Y
Brinell:	1/30 - 2.5/15.6 - 2.5/31.5 - 5/125(3) (Aluminum and its alloys) - 2.5/62.5(2) (Aluminum and its alloys) - 2.5/187.5(6) (Aluminum and its alloys) - 2.5/187.5(5) (Carbon steel) - 2.5/187.5(1) (Cast iron)
Brinell HBW:	HB1/10 - HB1/30 - HB2.5/6.25 - HB2.5/15.625 - HB2.5/31.25 - HB2.5/62.5 - HB2.5/187.5 - HB5/25 - HB5/125 - HB5/250
Vickers/Knoop:	HV1 - HV3 - HV5 - HV10 - HV15 - HV20 - HV30 - HV60 - HV100
Temperature:	Measure range from - 40.0 to + 80.0 °C

OPTIONAL TESTS

Shore:	ISO 2039, Shore A and D hardness scales for plastic
CHD:	Automatic Case depth measure with non-destructive process HDT method tracing case depth curve. Range till 1.5 mm / 0.06"

TECHNICAL DATA

Conformity Standards:	EN-ISO 6506-2 / EN-ISO 6507-2 / EN-ISO 6508-2 / EN-ISO 2039 / ISO 868 / ASTM-E10 / ASTM-E18 / ASTM-E103 / ASTM 2240 / ASTM-E384 / JIS
Accuracy:	Better than 0.5 %
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
Objectives:	1x 2x 3x 4x - Total magnification: 75x 150x 225x 300x (Only one objective is included)
Camera:	CCD high resolution camera (Only mod. 251VRSTV)
Indentation Reading and measurement:	251VRSTV: Automatic and semi-automatic through CCD camera and software (Computer as optional) 251VRSD: Semi-automatic with encoder - 251VRSA: Semi-automatic with encoder
Indenter Stroke:	Motorized 50mm / 2"
Height Capacity:	215 mm / 8.5" (As option 300 mm / 12")
Depth Capacity:	190 mm / 7.5" (As option 220 mm / 8.5")
Tolerable Weight:	2000kg
Temperature Range:	From 10 °C to 35 °C
Data Output:	RS 232 C (USB as option)
Power Supply:	110 or 220 V / 50÷60 Hz
Software:	Affri - OMAG
Fields Of Use	For all metals: iron, steel, tempered steel, cast iron, brass, aluminum, copper and metal alloys. Heat treatment, hardening, nitriding, cementation and hardfacing. Hard and soft plastics.
Packing:	50 x 60 x 100 cm / 20 x 23 x 40" - 85kg



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