

# SERIE MRS

Motorized hardness testers

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

Test loads from 1 to 250 kgf



**NEW!**

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

**AFFRI**

# 3332 MRS

## MOTORIZED MEASURING HEAD

The 3332 MRS hardness tester is a fully motorized system for automatic preloading, loading and measurements. MRS 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 immediately appears on the large display.

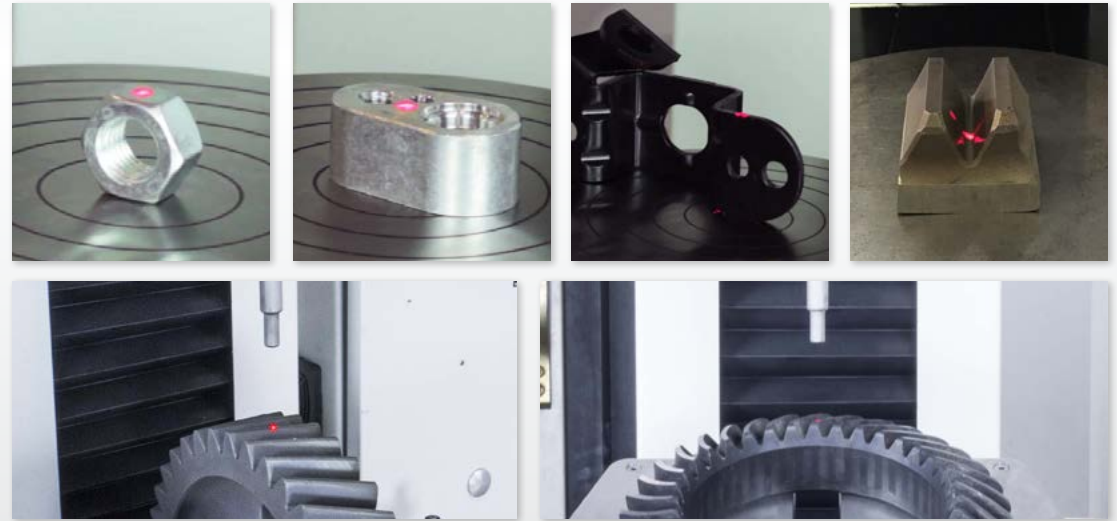


! Fully motorized and automatic, the test is not affected by operator influences and can easily be used by operators of every level.



## 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)



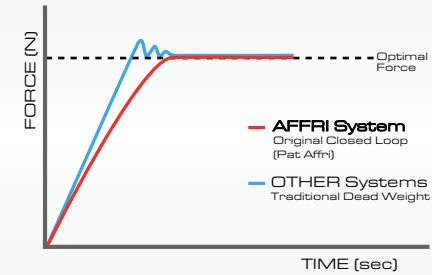
## LED LIGHT

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)

# 3332 MRS

## 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 or external vibration. Accurate measurements, even on the first test, eliminate the need for multiple tests. There is no need to perform 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, SAVING TIME AND MONEY, THUS INCREASING OUTPUT AND PRODUCTIVITY





## MOTORIZED MEASURING HEAD

Fully motorized adjustable testing stand up to 500 mm / 20" vertical capacity including automatic contact with test surface from every distance with single start input (As option up to 700 mm / 28"). The activation of the test cycle is automatic, it starts when the head makes contact with the specimen which is automatically recognized at any position within the vertical stroke.



## PROTECTED INDENTER

The indenter is protected and retracted, it only moves down after the specimen is fully clamped and stable, minimizing the risk of accidental damages. The exclusive Affri diamond indenter has a longer life-span than any other indenter on the market.

Special indenter to reach difficult test positions like holes or stair steps.



## LARGE BASE

The 3332MRSA wide work table is capable of bearing masses up to 2000 kg which allows for steady hardness measurements on bulky or irregular pieces which cannot be easily received by the regular bench hardness tester. Also, it offers a comfortable working base for small pieces.



## MOTORIZED INDENTER STROKE

The hardness tester is equipped with an additional motor which moves the indenter and the clamping hood for a stroke of 50 mm. This is a stand-alone extra stroke which works separately from the total head stroke (available on the tester 3302MRSA).

During the test, the head can move for the whole vertical stroke generating a constant pressure when the specimen is clamped. The constant clamping surface assures the right measurement with no need to repeat the test. When testing unstable samples or deflective parts, the measuring head follows the sample without losing contact. The top surface referencing design minimizes errors caused by problems associated with dirt or scale. This reduces sample preparation time and increases both accuracy and speed.



! The activation of the test cycle is automatic, it starts when the head makes contact with the specimen which is automatically recognized at any position within the 50 mm / 2" of vertical stroke.

## 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 moves with the head for the whole vertical stroke generating a constant pressure of 50 kgf when the specimen is clamped (additional clamping force adjustable up to 400 kgf).

The clamping system assures perfect stability of any test piece throughout the test cycle. No additional accessories are required.



## TEST 3332MRS AFFRI® MACHINES WITH:

Bulky pieces, irregular pieces, unfinished pieces, pieces that are raised or misaligned, pieces used with every kind of support (lifting screw, deformable materials, etc.), pieces with impurities (dust, oil, etc.). Accuracy and repeatability will be assured in every test condition.

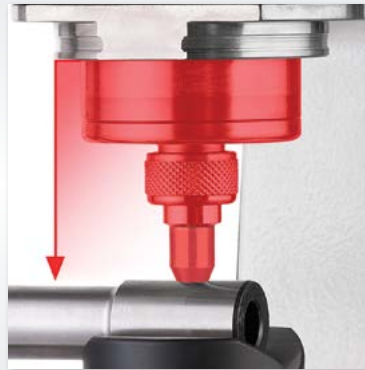


# 250 MRS

Traditional testing stand with fixed head and adjustable elevating work table

## MOTORIZED MEASURING HEAD

The 250 MRS hardness tester is a fully motorized system for automatic preloading, loading and measurements. MRS 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 immediately appears on the large display.



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



## MOTORIZED VERTICAL STROKE

The MRS measuring head is fully motorized with a vertical sliding stroke of 50 mm / 2". When testing unstable samples or deflective parts, the measuring head will follow the sample without losing contact. Easy and fast hardness measurements on pieces with different thicknesses without acting on the tester head or elevating screw.

The top surface referencing design minimizes errors caused by problems associated with dirt or scale. This reduces sample preparation time and increases both accuracy and speed.



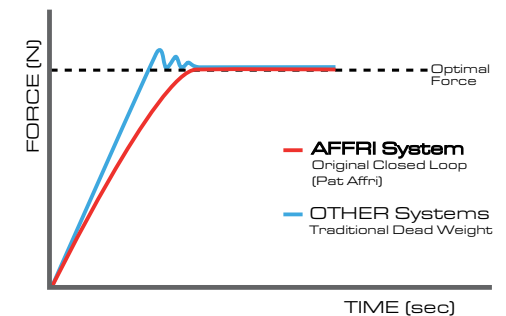
The activation of the test cycle is automatic, it starts when the head makes contact with the specimen which is automatically recognized at any position within the 50 mm / 2" of vertical stroke.

## 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 or external vibration.

Accurate measurements, even on the first test, eliminate the need for multiple tests. There is no need to perform 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 result is correct and absolute, saving time and money, thus increasing output and productivity



# 250 MRS



## PROTECTED INDENTER

The indenter is protected and retracted, it only moves down after the specimen is fully clamped and stable, minimizing the risk of accidental damages. The exclusive Affri diamond indenter has a longer life-span than any other indenter on the market.



! The clamping system assures perfect stability of any test piece throughout the test cycle. No additional accessories are required.



## 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, it moves with the head for the whole vertical stroke generating a constant pressure. No additional accessories are required. This feature allows steady measurements on medium-large specimens.



## EXTREME PRECISION

The 250MRS hardness tester guarantees maximum reliability even in bad conditions. The synergy between the tester features allows for a correct result even if the piece is badly positioned. The measurement is not compromised if the piece is dirty with oil or dust.

## 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 piece holder anvils: from large plane tables to V shaped anvils or special solutions for irregular specimens.



## TEST 250MRS AFFRI® MACHINE WITH:

Bulky pieces, irregular pieces, unfinished pieces, pieces that are raised or misaligned, pieces used with every kind of support (lifting screw, deformable materials, etc.), pieces with impurities (dust, oil, etc.). Accuracy and repeatability will be assured in every test condition.



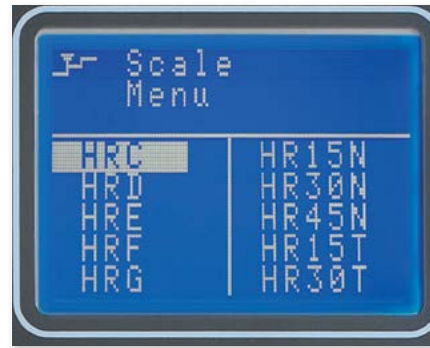
# SERIE MRS

## DIGITAL DISPLAY AND SOFTWARE

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

- **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° useful 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 with IP 64 protection. Powered by rechargeable battery for 100% portability of the hardness tester (OPTION).

MRS 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. IP 64 protection.



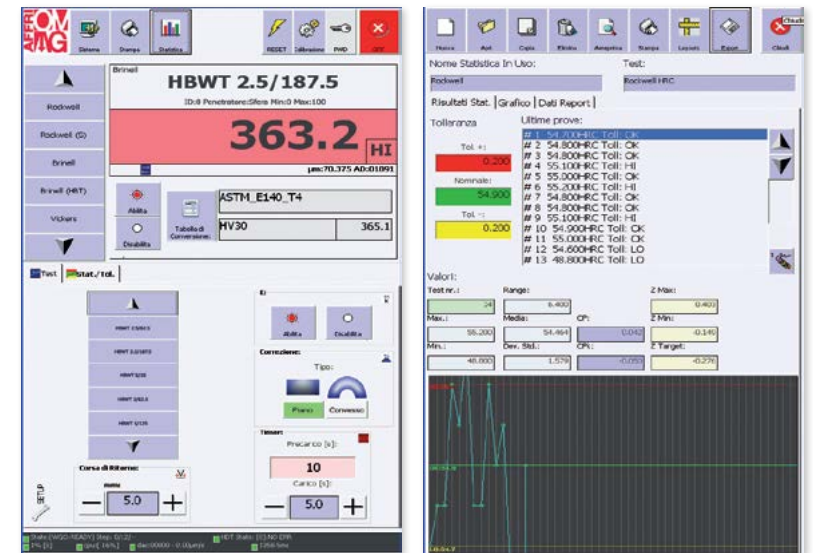
# 250 MRS PC

## TOUCHSCREEN AND STATISTIC SOFTWARE

250 MRS PC is a special model which integrate a large LCD multicolour touch panel and a powerful tablet PC with Windows® operative system.

The user-friendly software is designed with easy setting parameters for measurement setup, statistics and data storage. Hardness scales can be quickly selected from large and clear tabs. Conversion scales, correction for round samples and calibration off-set are always visible. Results are divided according to tolerances and can be viewed in three different types of graphs.

Setup customized personal test cycles. Different operators can select their own program finding the software as they left it.



## INDENTERS

700.0.3.010 - Diamond 120° HR  
700.0.3.011 - Diamond 136° HV  
700.0.3.002 - Ball W ø1mm  
700.0.3.004 - Ball W ø2,5mm  
700.0.0.003 - Ball W ø5mm  
700.1.3.008 - Ball W ø10mm  
700.0.3.003 - Ball W ø1/16"  
700.0.3.005 - Ball W ø1/8"  
700.0.3.007 - Ball W ø1/4"  
700.1.6.001 - Ball W ø1/2"  
700.0.3.016 - 70mm extenden  
diamond indenter 120° HR  
026.4.0.002 - 70mm Indenter guide  
clamping piece ø12mm

## TEST BLOCKS

601.0.0.001 - HRA  
601.0.0.002 - HRB  
601.0.0.003 - HRC  
601.0.0.004 - HRD  
601.0.0.010 - HR15N  
601.0.0.011 - HR30N  
601.0.0.012 - HR45N  
601.0.0.020 - HR15T  
601.0.0.021 - HR30T  
601.0.0.022 - HR45T  
600.0.0.003 - HBW 2.5/62.5  
601.0.0.005 - HBW 2.5/187.5  
600.0.0.001 - HBW 5/125  
602.0.0.003 - HV10  
602.0.0.004 - HV30

## ANVILS

A013.0.000 - Fix anvil support  
A014.0.001 - Flat anvil ø60mm  
A014.0.002 - Flat anvil ø150mm  
A014.0.003 - V face anvil ø60mm for diameters from 8 to 220mm  
A014.0.004 - Double Spot anvil Ø25mm flat + V for diameters from 5 to 30 mm  
A009.0.005 - V Support H 50mm  
A009.0.006 - V Support H 100 mm

## EXTRA ACCESSORIES

022.0.3.009 - Fix Clamping piece  
431216 - Microscope 20x div 0.01 field 6 mm, including LED  
A010.0.022 - Table for hardness tester  
A017.4.000 - Self centring clamping base for round samples  
E008.010 - L.I.S.A. Laser indicator patented Affri System  
A049.1.001 - Adjustable vice from 0 to 50mm  
A009.0.001 - Manual table 100x100mm with 10µm step



## 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 the hardness tester periodic calibration with UKAS/ACCREDIA certificate, for any hardness scale and value.

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

## REAL TIME SUPPORT

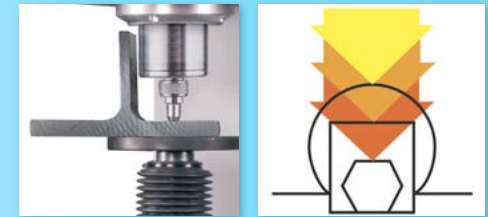
Real Time Support. Connect your hardness tester to Internet, so that we can remotely diagnose any technical issue, provide additional operator training and update software version.

Connect to [www.affri.com](http://www.affri.com) for more details.



**MRS HARDNESS TESTERS ARE EQUIPPED WITH AN ADDITIONAL MOTOR WHICH MOVES THE INDENTER AND THE CLAMPING HOOD FOR A STROKE OF 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.



**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 (Generate indentation)**

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 (Generate indentation)**

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 range from - 40.0 to + 80.0 °C



**3332/3302 MRSA**

Motorized adjustable height capacity through buttons.

Motorized measuring system vertical stroke.

Large base with slots for accessories.  
330 x 390 mm.

Height Capacity: 500 mm / 19.5"  
(As option up to 700 mm / 27.5")  
Depth Capacity: 200 mm / 8"



**3332 MRS**

Motorized measuring system vertical stroke.

Large base with T slots for accessories.  
270 x 380 mm.

Height Capacity: 380 mm / 15"  
Depth Capacity: 200 mm / 8"



**250 MRS**

Motorized measuring system vertical stroke.

Interchangeable anvils to accommodate any specimen.

Adjustable elevating screw with cover.

Height Capacity: 215 mm / 8.5"  
Depth Capacity: 190 mm / 7.5"



# SERIE MRS

## 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 - HRK - 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)
Vickers/Knoop:	Generate indentation
Temperature:	Measure range from - 40.0 to + 80.0 °C

## OPTIONAL TESTS

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
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 %
Indenter Stroke:	Motorized 50mm / 2"
Height Capacity:	250MRS: 215 mm / 8.5" (As option 300 mm / 12") - 3332MRS: 380 mm / 15" - 3332MRSA: Motorized 500 mm / 19.5" (As option up to 700 mm / 27.5")
Depth Capacity:	250MRS: 190 mm / 7.5" (As option 220 mm / 8.5") - 3332MRS and 3332MRSA: 200 mm / 8"
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
Principle of Operation:	Load Cell and Closed Loop (Affri patent)
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



**Made by:**

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