OPERATIONAL MANUAL

MICROBUL-N

LOW LOAD VICKERS HARDNESS TESTER

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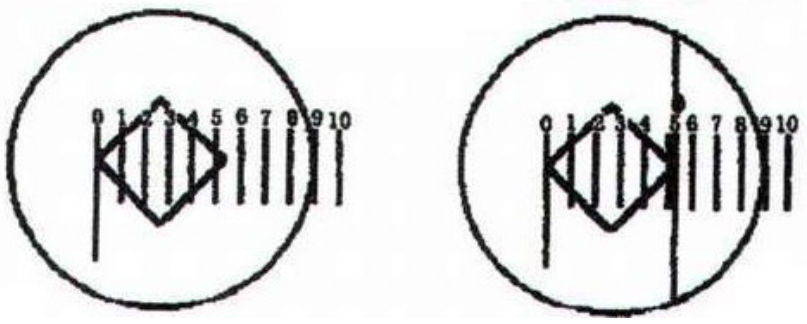
1 Technical Features

Test loads (kgf)	***0,5;1;3;5 (10kgf on request)***
Load selection	***Manuel***
Test methods	***Vickers***
Load application	***Automatic***
Total magnification of measuring microscope	***360X (with 25X objective)*** ***140X (with 10X objective)***
X-Y table dimensions (mm)	***100X100***
X-Y table travel (mm)	***25***
Max. testing height (mm)	***160***
Depth of throat (mm)	***130***
Power supply	***AC 220V, 50Hz***
Machine dimensions (mm)	***750(H)X500(D)X300(W)***
Case dimensions (mm)	***870(H)X590(D)X440(W)***
Weight (net /gross) kg	***68 / 100***

2 Standard Accessories

Vickers pyramid diamond indenter……..One off
HV Test block……... One off
X-Y table……..One off
Digital encoder ocular……....One off
V anvil…….. One off
Accessories box…… One off
Set of alien keys……One off
Operational manual (English)…….. One off
Hardness conversion table……...One off
Calibration Certificate…… One off

Turn the drum to touch the "0" line of the micrometer to the left corner of the pyramid.



Turn the drum and touch the other line to the right corner of the pyramid as above. Press the button of the digital eyepieces and read the value directly.

Objective	Total Magnification	Measurement Accuracy
10X	140X	0,062 μm
25X	360X	0,026 μm

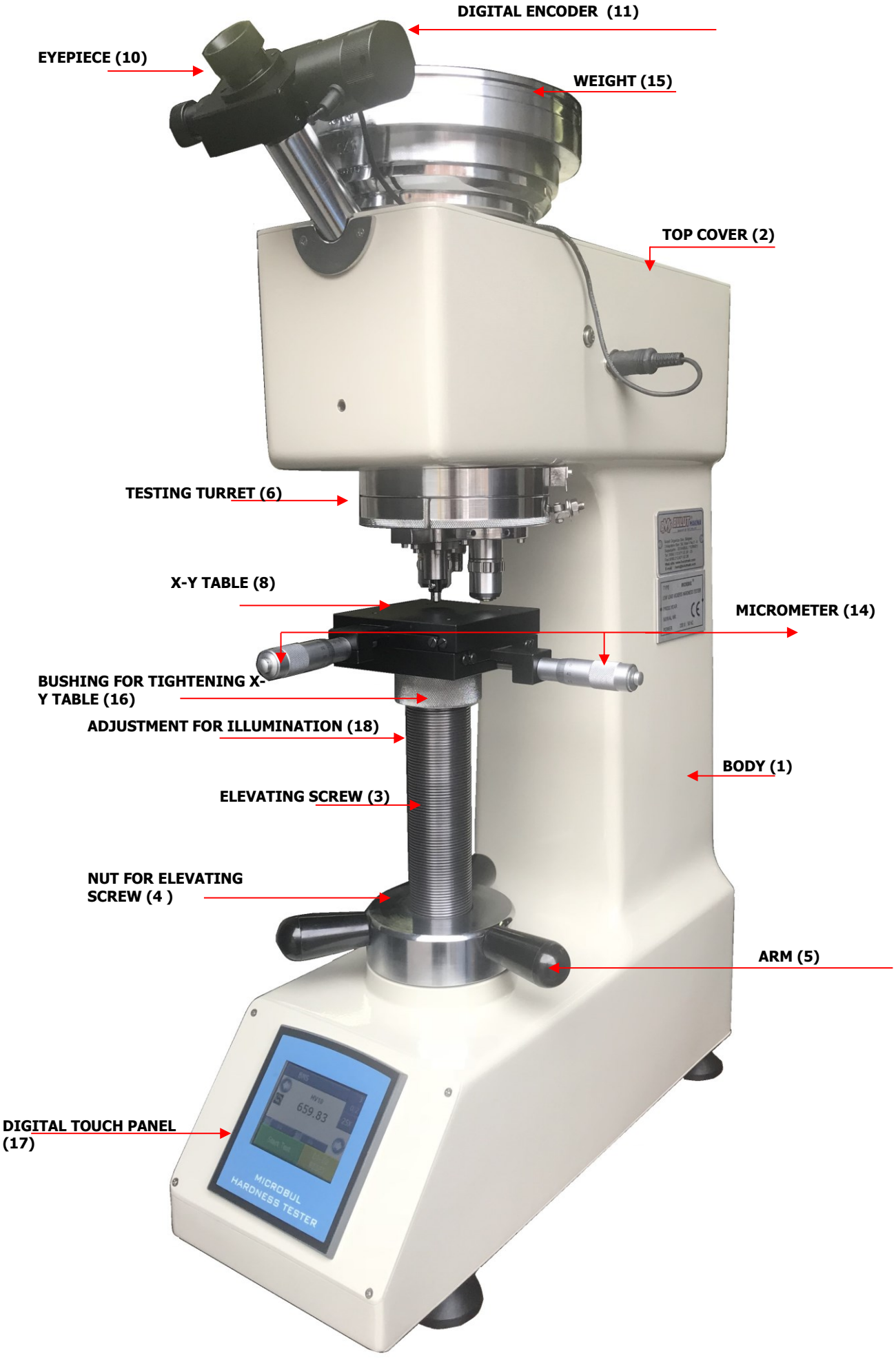

DIGITAL ENCODER (11)
EYEPIECE (10)
WEIGHT (15)
TOP COVER (2)
TESTING TURRET (6)
X-Y TABLE (8)
MICROMETER (14)
BUSHING FOR TIGHTENING X-Y TABLE (16)
ADJUSTMENT FOR ILLUMINATION (18)
BODY (1)
ELEVATING SCREW (3)
NUT FOR ELEVATING SCREW (4)
ARM (5)
DIGITAL TOUCH PANEL (17)
659.83
MICROBUL HARDNESS TESTER

Fig.1

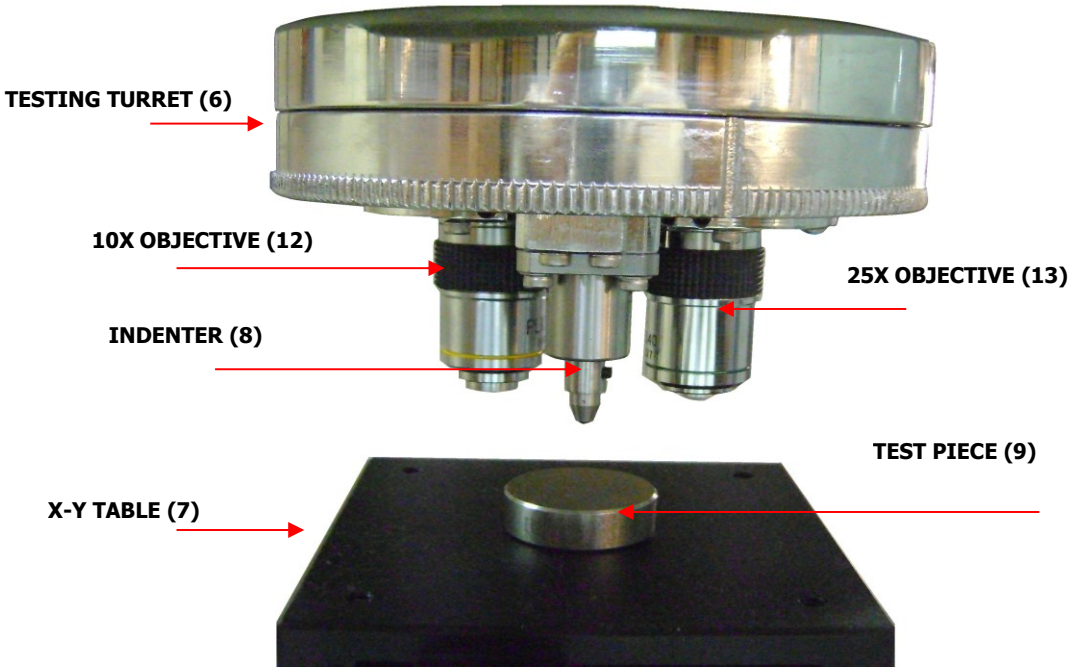


Fig.2

3 Part List

1	Body	10	Eyepiece
2	Top cover	11	Digital encoder
3	Elevating Screw	12	10X Objective
4	Nut for Elevating Screw	13	25X Objective
5	Arm	14	Micrometer
6	Testing turret	15	Weight
7	X-Y Table	16	Bushing for tightening X-Y table
8	Indenter	17	Digital Screen Panel
9	Test Piece	18	Adjustment for Illumination

4 Installation and Operation

4.1 Installation

1-The tester must be put in a room where there is no vibration and corrosive gas and whose room temperature shall be around 10~35 ° C and relative humidity no more than 70%. The power fluctuation shall be within 220V±10%. It shall be placed on a stable table which shall be perforated for screw lead to pass through. (Pals refer to drawing)

2-Take out weights (15) and eyepiece (10) from accessories box. And locate eyepiece and suitable weight (s) according to test to be applied.

3-Take out also X-Y table (7) from accessories box. Clean it well and locate it to the elevating screw hole and tighten it by means of knurled bushing (16). Adjust level of hardness tester by means of eye bull putting on X-Y table.

4-Connect power cable to power supply AC 220V and the other to power socket of the tester.

4.2 Preparation Prior To Testing

a) The surface to be tested must be smooth and free of oxides and impurities. The surface finish must be enough for accurate the measurement of diagonal line of indentation. Generally, Ra shall be no more than 0.2um.

b) Suitable test load, thickness of test piece (or case depth) and hardness to be chosen from related table.

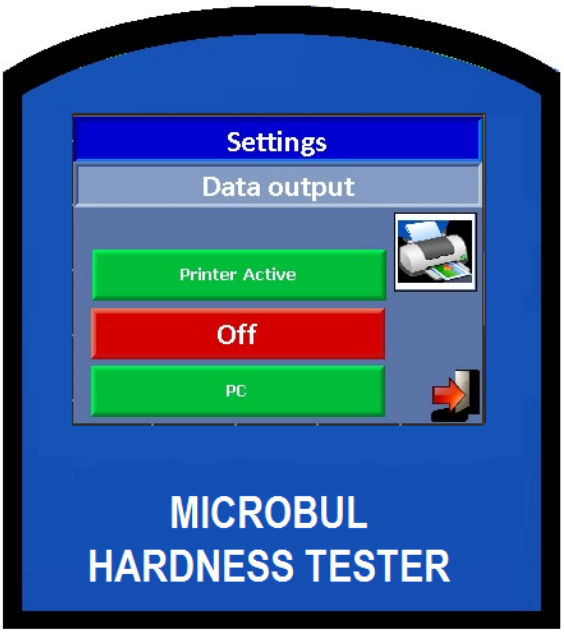
5 Main Screen / Screen Display

6 Main Menu

Settings display is using for enter the function, such ***as printer, date / time average name, test duration, factory settings, test lower limit, test upper limit, language selection.***

7 Settings


Settings
Data output
MICROBUL
HARDNESS TESTER


Settings
Data output
Printer Active
Off
PC
MICROBUL
HARDNESS TESTER


Settings
Date/Time
MICROBUL
HARDNESS TESTER


Settings
Date/Time
Cal
MICROBUL
HARDNESS TESTER

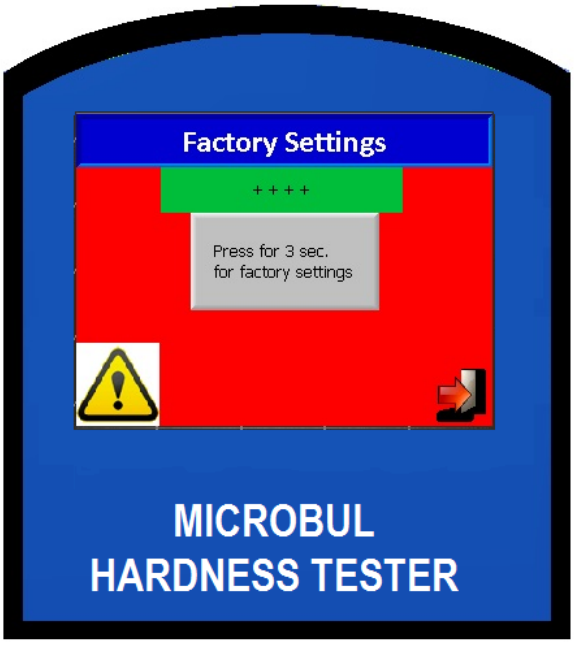

Settings
Average Qty
MICROBUL
HARDNESS TESTER


Average qty
MICROBUL
HARDNESS TESTER

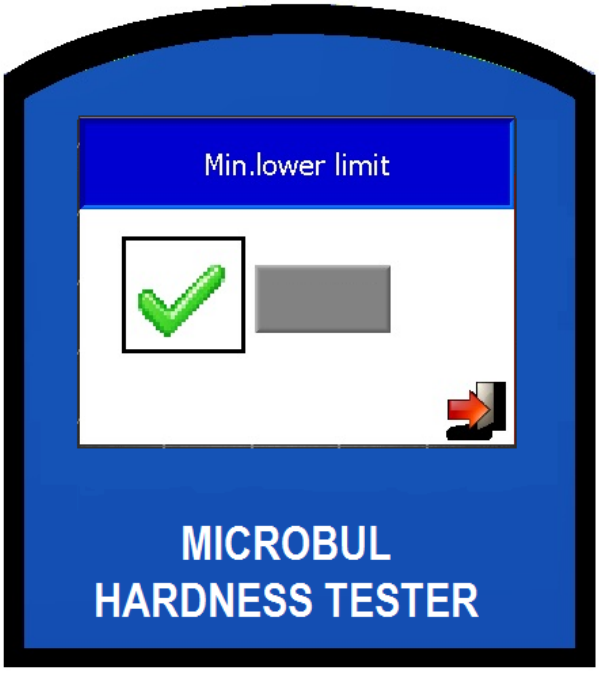

Settings
Testing Time
MICROBUL
HARDNESS TESTER


Testing time
MICROBUL
HARDNESS TESTER


Settings
Factory Settings
MICROBUL
HARDNESS TESTER


Factory Settings
+ + + +
Press for 3 sec.
for factory settings
MICROBUL
HARDNESS TESTER


Settings
Lower Limit
MICROBUL
HARDNESS TESTER


Min.lower limit
MICROBUL
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Settings
Upper Limit
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HARDNESS TESTER


Max.upper limit
9999.99
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HARDNESS TESTER


Settings
Language
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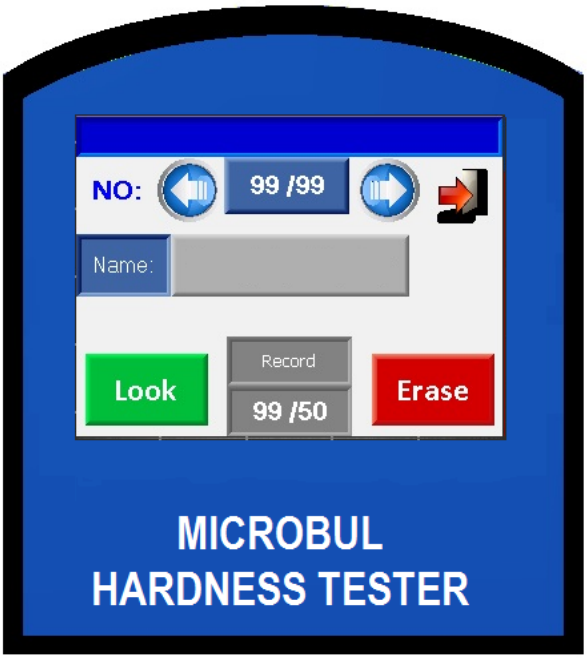
Language
TÜRKÇE
РОССИЯ
ENGLISH
ITALIANO
ESPAÑOL
اللغة العربية
DEUTSCHE
FRANÇAIS
MICROBUL
HARDNESS TESTER

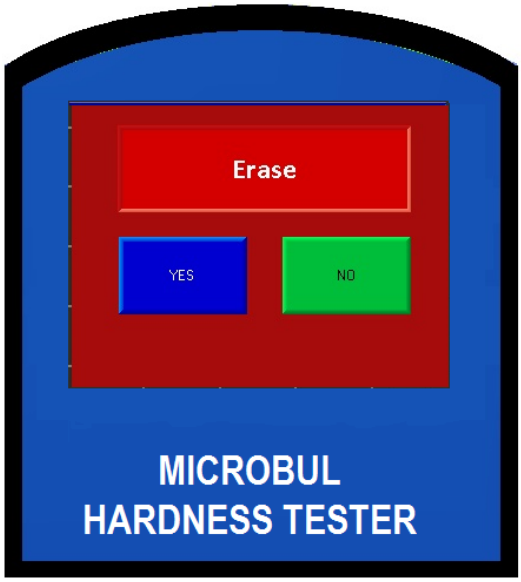

Settings
SCANNING
MICROBUL
HARDNESS TESTER


Settings
SCANNING
EYEPIECE
CAMERA
MICROBUL
HARDNESS TESTER

8 Records

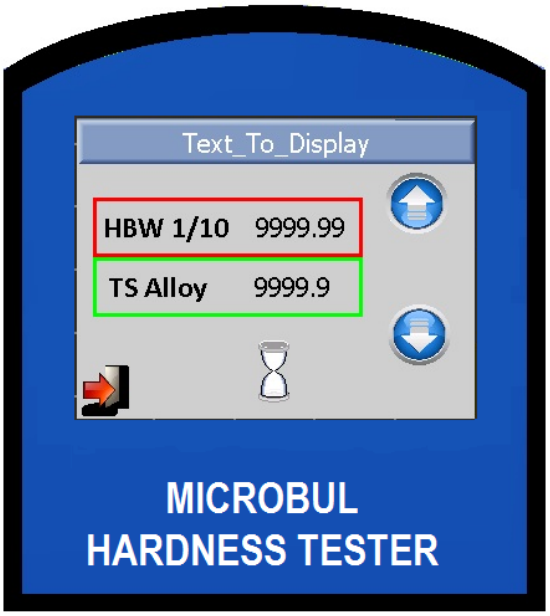

NO:
99 /99
Name:
Look
Record
99 /50
Erase
MICROBUL
HARDNESS TESTER


Records full
MICROBUL
HARDNESS TESTER

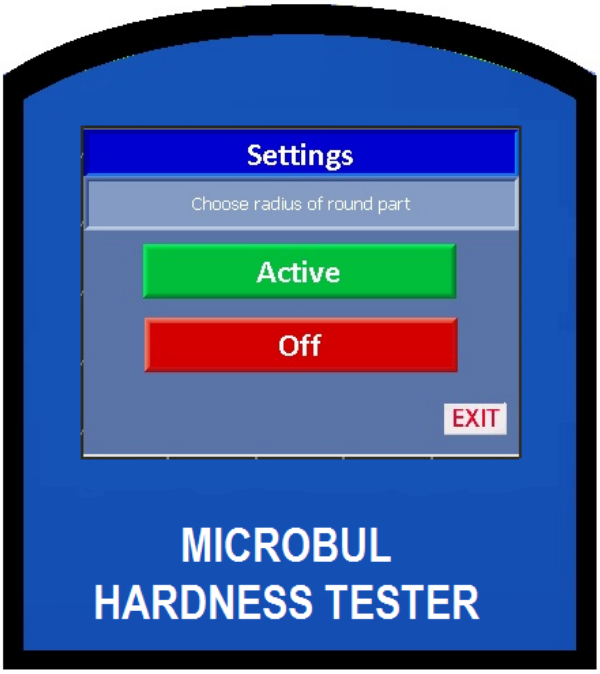

Erase
YES
NO
MICROBUL
HARDNESS TESTER


Name:
Text_To_Disp
Print
No
Testing
Test method
Date
Time
Min:
Ave:
Max:
S.devi
No
9999.99
999.99
Text_To_
Text_
99 /99
MICROBUL
HARDNESS TESTER


Text_To_Display
Print
Max:
Ave:
Min:
S.deviation
9999.99
Text_To_
MICROBUL
HARDNESS TESTER



Results can be turn the method using  icon



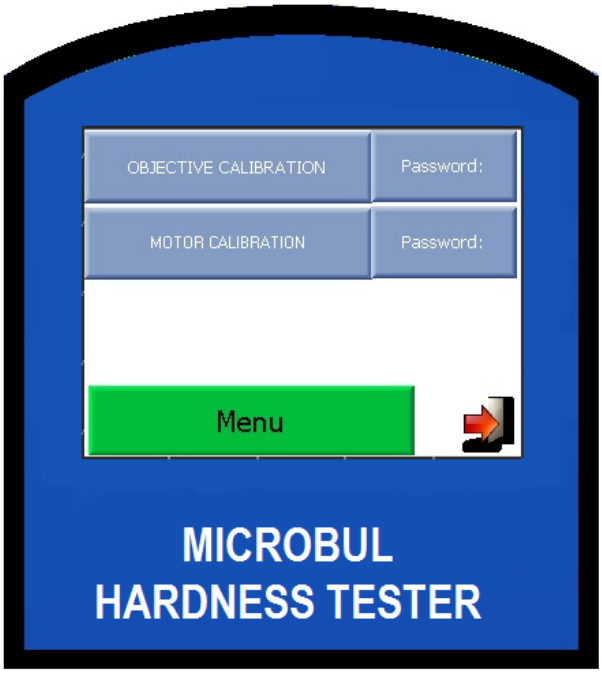
9 Calibration

9.1 Objective Calibration

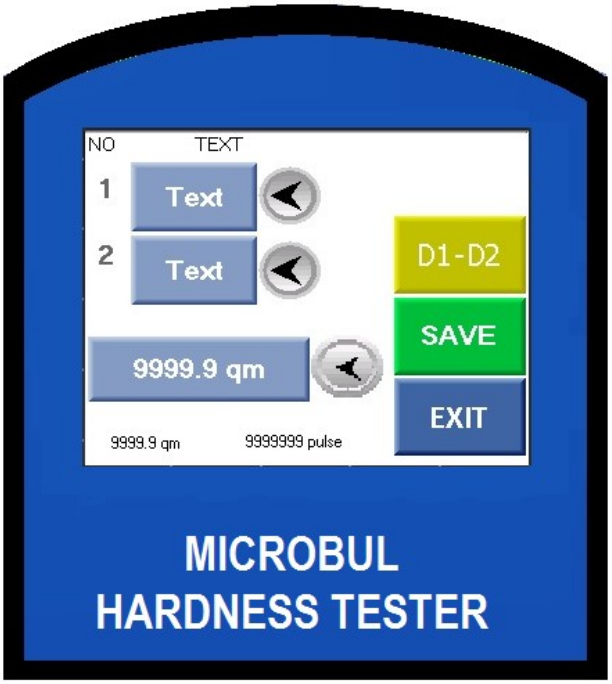
<u>The device is calibrated by our company and not need to calibrate again by the user.</u>

If necessary, the calibration of the device must be carried out by qualified personnel. If the person performed an incorrect calibration, the original calibration values can be recalled by entering SETTINGS and using the RESTORE FACTORY SETTINGS function.

You need to enter the password for the objective and motor setting. Here you can select the objective, motor setting and magnification factor. (This factory is saved as a setting and it is highly advised not to change it without asking the manufacturer even if the password is known.)



9.2 Motor Calibration

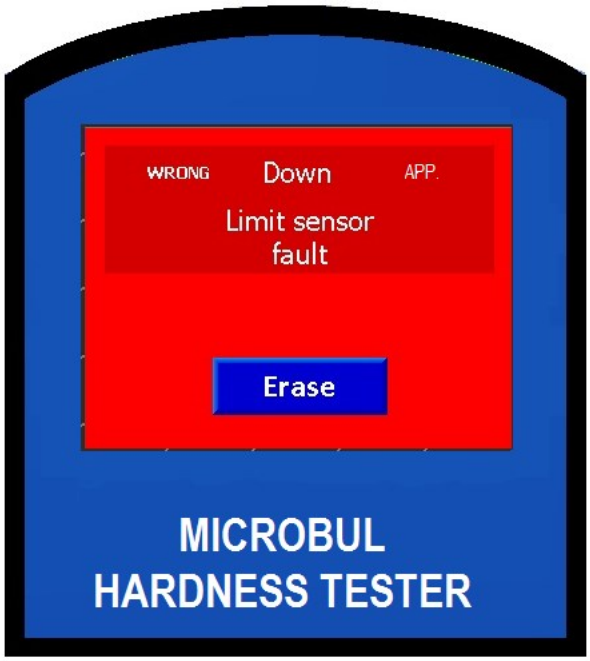


If you want to make a calibration as a factory calibration you need know the password
NOTE: If the values are stored as factory settings, calibration must be repeated if the calibration is incorrect.

10 Test Method

10.1 Test Screen

NOTE: If you see the screen below after waiting for some time after the start button has been pressed, the optical sensor is out of order and you need to contact the company.



When you enter password you can change objective setting and magn. (This is factory setting and not recommended to make any change without asking manufacturer.)

11 Starting Test

1-Turn on the power switch and the illuminating lamp is on.
2-As per the above preparation, choose suitable test load and objective.
3-Put the test sample onto the test table in a way that the tested surface is perpendicular to the axis of main shaft.
4 - By rotating turret bring indenter to the front and by raising elevating screw with help of arms, adjust indenter tip distance approx.2 mm to test piece
5-Turn the 10X objective to the front, by rotating testing turret with help of arm. And object surface of the objective is about 6 mm away from the surface of test sample (this can be adjusted approx.1, 5 mm for 25X objective) by raising elevating screw slowly and at the same time observe through eyepiece glass until the

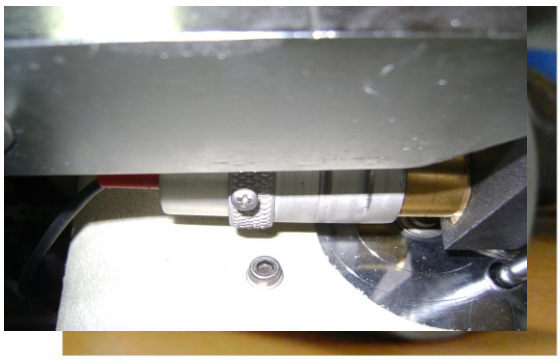
processed hint can be seen clearly on the surface of test sample. If the division on the division plate is not clear, turn the ocular glass until it becomes clear.
6-Turn the indenter to the front and press down the (START) key on MICROBUL panel. Then the tester will automatically accomplish the process of loading —dwelling—unloading and will return to the original position.
7-Turn the suitable objective (either 10X or 25X). To the front and measure the indentation with the digital encoder.
Turn the micro-move handle so that the 0 division line of micrometer is tangent to one angle of the indentation,
Make sure when the machine is on, before test don't forget the press D1+D2 RESET button on test screen
Press the button for d1 than press again for d2.
Than you will see the test result on the MICROBUL panel

Objective	Total Magnification	Distance between two lines in eyepiece	Distance between two lines in micrometer
10X	140X	59 µm	0,59 µm
25X	360X	24 µm	0,24 µm

For above sample, HV1, using 25X objective, every line is accepted as of 100 units.5X100 units= 500 + 18 lines on micrometer = 518 units. Input 518 for 1.Point on MICROBUL panel. Read second vale by turning 90 ° of eyepiece and input 518 for 2. point and press and see result on panel. (See main screen of MICROBUL)
Note:
The coincidence of 0 division line of micrometer and zero line of centigrade cylinder shall be corrected at random during the test process. If not coincident, loose the three screws on the centigrade cylinder and turn lightly the outside ring until they are coincident. And then tighten those three screws

12 Maintenance

The hardness tester is a precise instrument that must be maintained carefully to keep its accuracy.
Should something be wrong with the illumination of the tester, it can be replaced by the illumination in the accessory box as follows



1-Turn power off.
2-Open the left cover of machine. Hold it housing as per shown in above picture and remove out it complete.
3-Loose the bulb by twisting and take it out .Replace with a new 12V - 5W bulb.
Note: Illumination is durable to use.