OPERATIONAL MANUAL

MICROBUL

LOW LOAD VICKERS HARDNESS TESTER

BMS Bulut Makina Sanayi Ve Ticaret Ltd. Şti.

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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 thoroat (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 (nett /gross) kg	***68 / 100***

1.2Standart Accessories

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

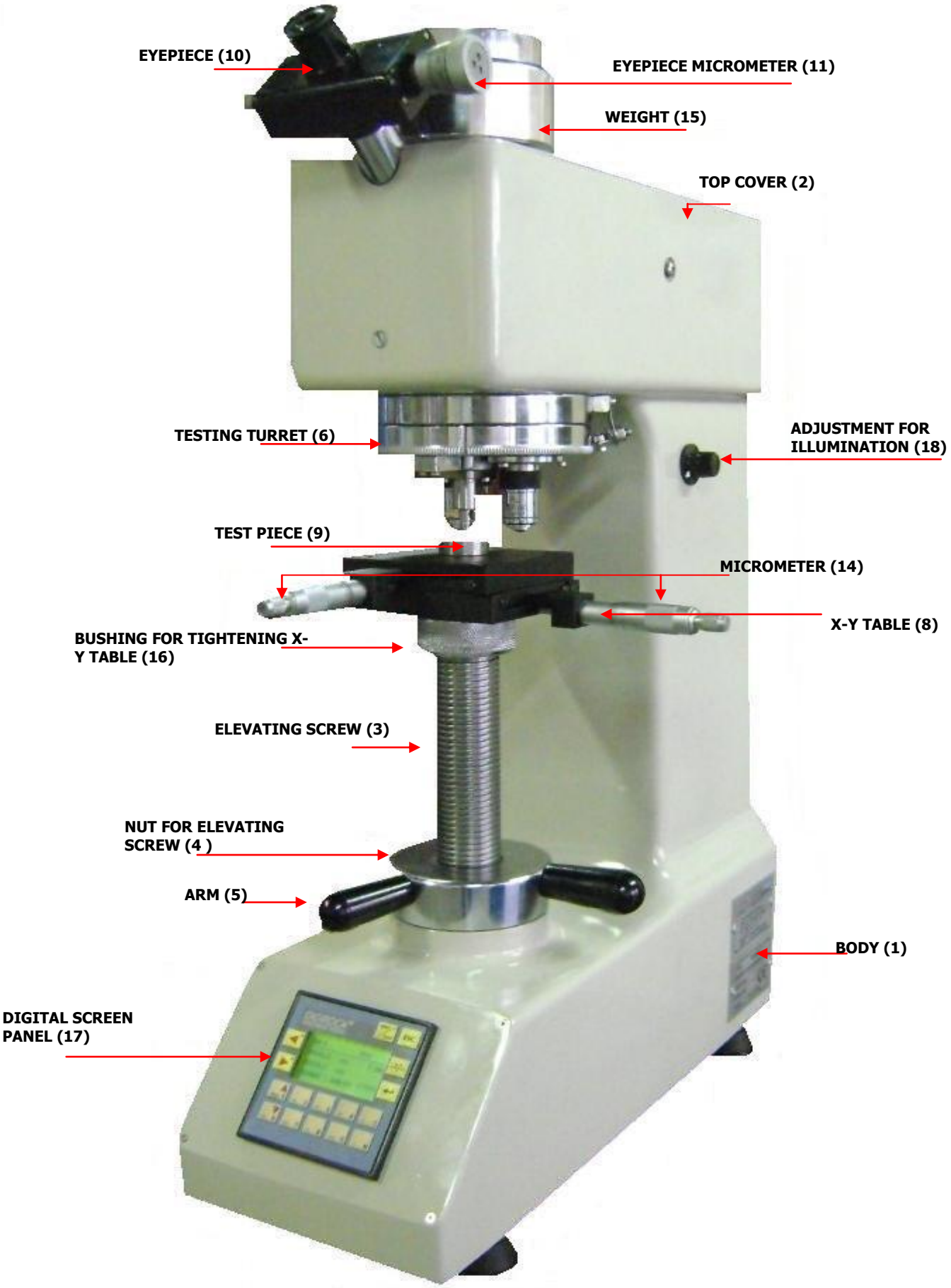

EYEPIECE (10)
EYEPIECE MICROMETER (11)
WEIGHT (15)
TOP COVER (2)
TESTING TURRET (6)
ADJUSTMENT FOR ILLUMINATION (18)
TEST PIECE (9)
MICROMETER (14)
X-Y TABLE (8)
BUSHING FOR TIGHTENING X-Y TABLE (16)
ELEVATING SCREW (3)
NUT FOR ELEVATING SCREW (4)
ARM (5)
BODY (1)
DIGITAL SCREEN PANEL (17)

Fig.1

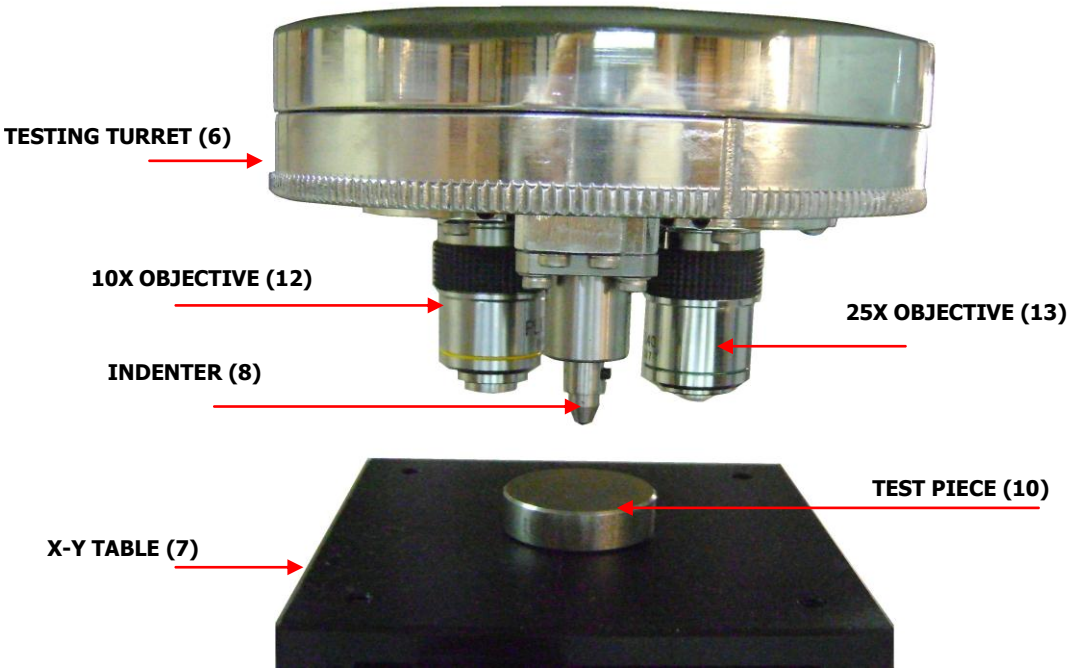


Fig.2

2.Part List

1	Body	10	Eyepiece
2	Top cover	11	Eyepiece micrometer
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	Digİtal Screen Panel
9	Test piece	18	Adjusment for illumination

3.Installaton And Operation

3.1.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. (Pls refer to drawing)

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

3-Take out also X-Y table (7) from from accessorries box.Clean it well and locate it 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.

3.2Preparation Prior To Testing

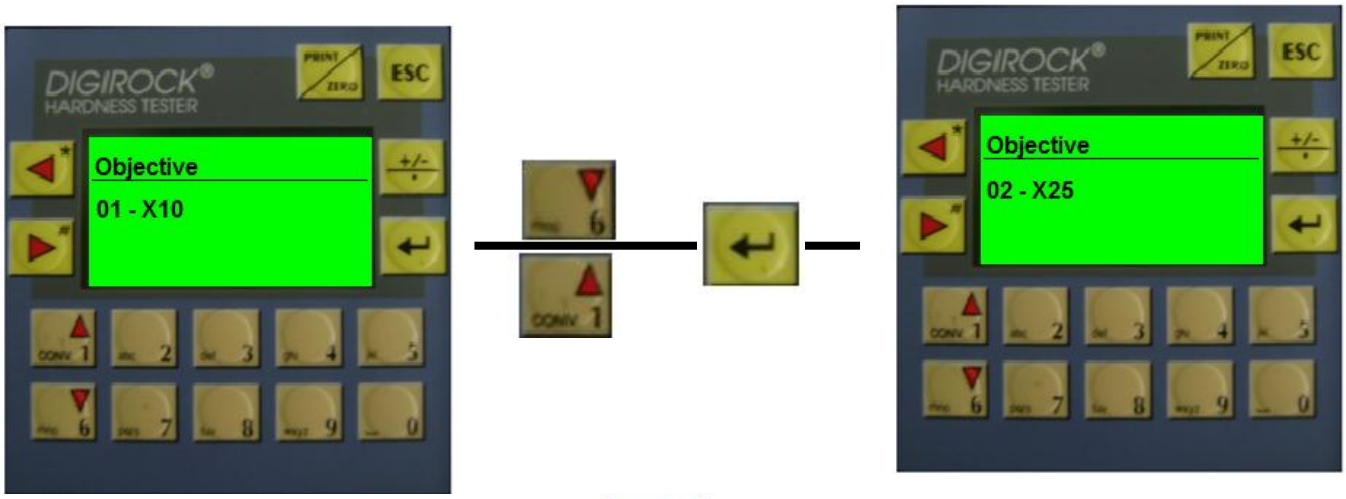
a) The surface to be tested must be smooth and free of oxides and impurities. The surface finish must be enough for accurate the measurement of diagonal line of indentation. Generally, Ra shall be no more than 0.2um.

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

4.Main Screen / Screen Display

5.Functions Of Buttons On Panel

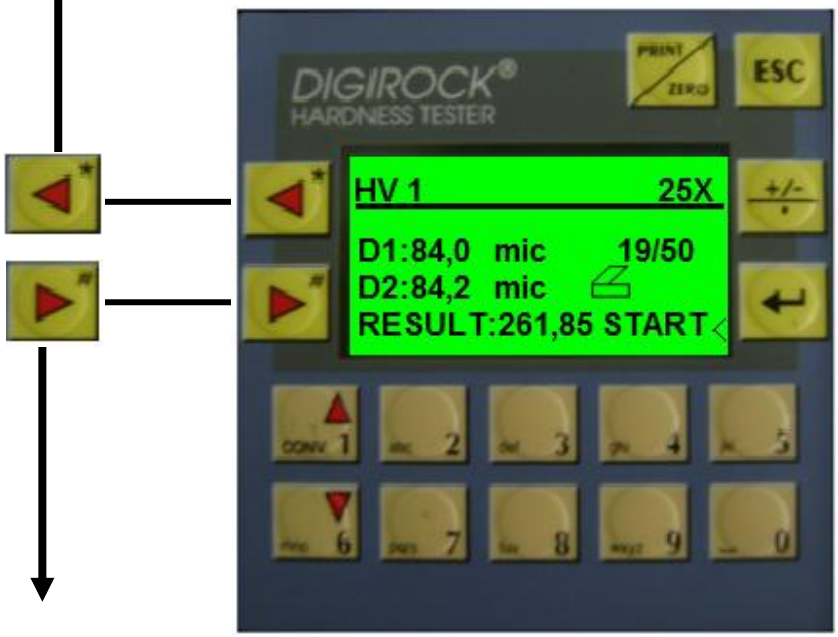
	BACKWARD & FORWARD	USED FOR PURPOSE OF MAKING TRANSITION AMONG ALTERNATIVE MENUS
	UP&DOWN	USED FOR ENTERING FOR VARIOUS FUNCTIONS IN SELECTED MENU
	ENTER	CONFIRMATON OF ENTERING VALUE
		DECIMAL NUMBER
	ESC	USED FOR CANCELLATION

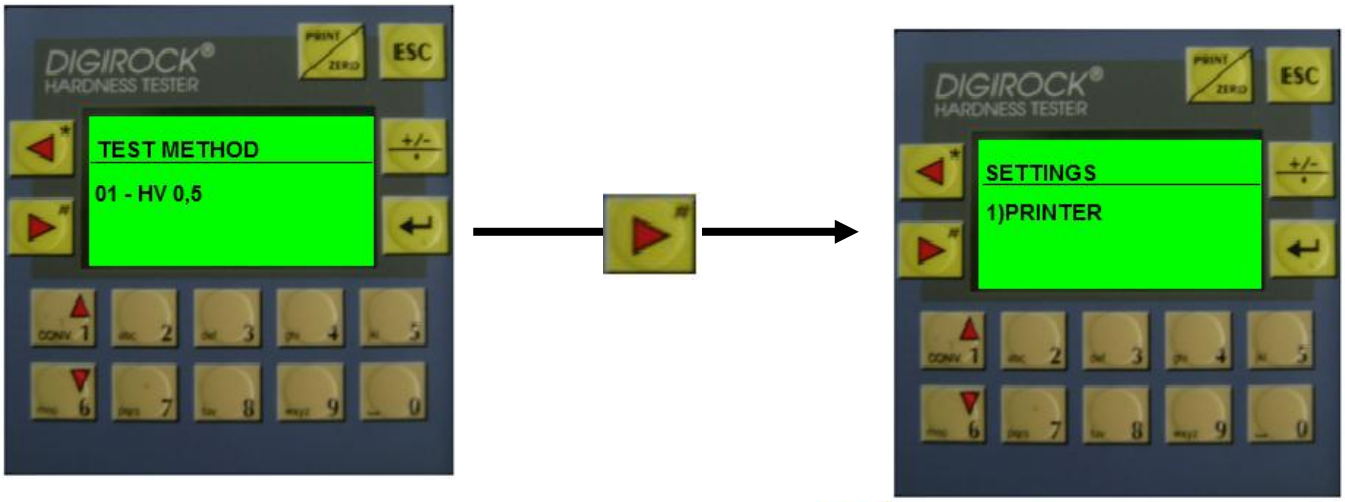


01 - X10 CONV 1 02 - X25

After choosing objective type press ESC ESC

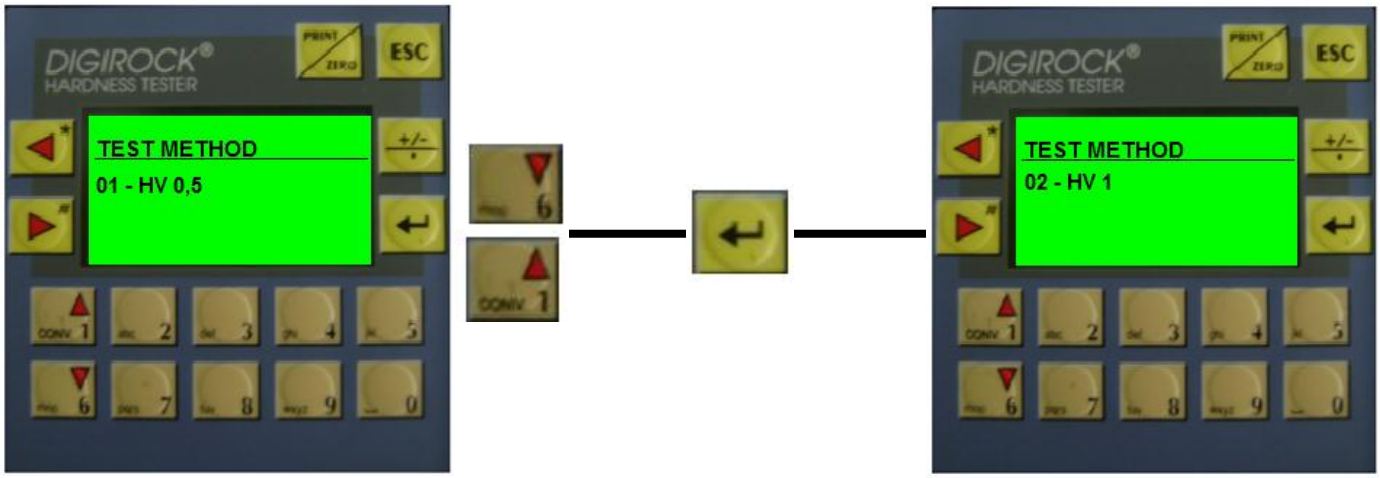
6.Main Screen





Objective TEST METHOD SETTINGS

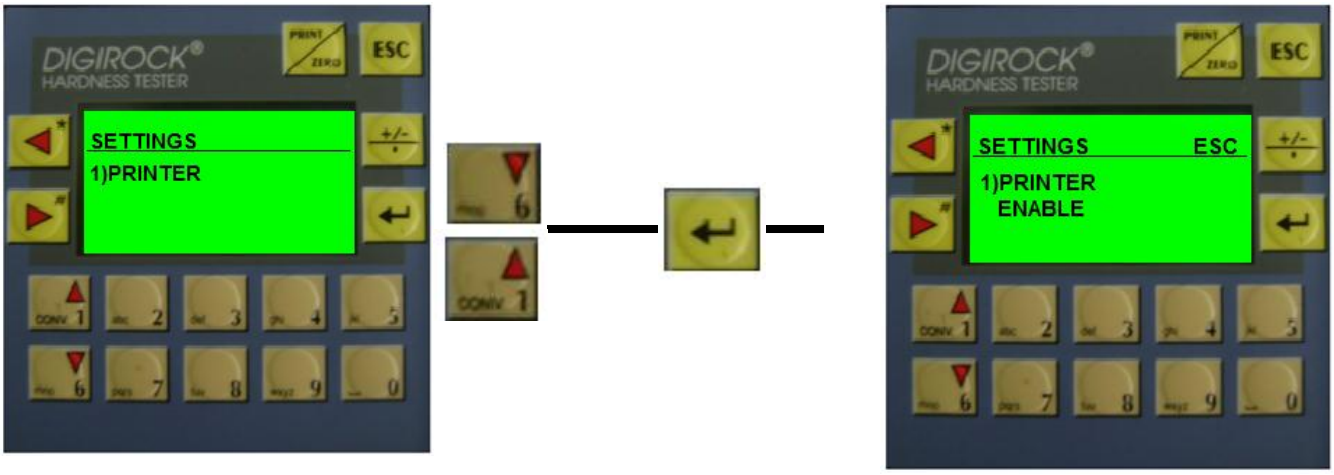
7.Test Method



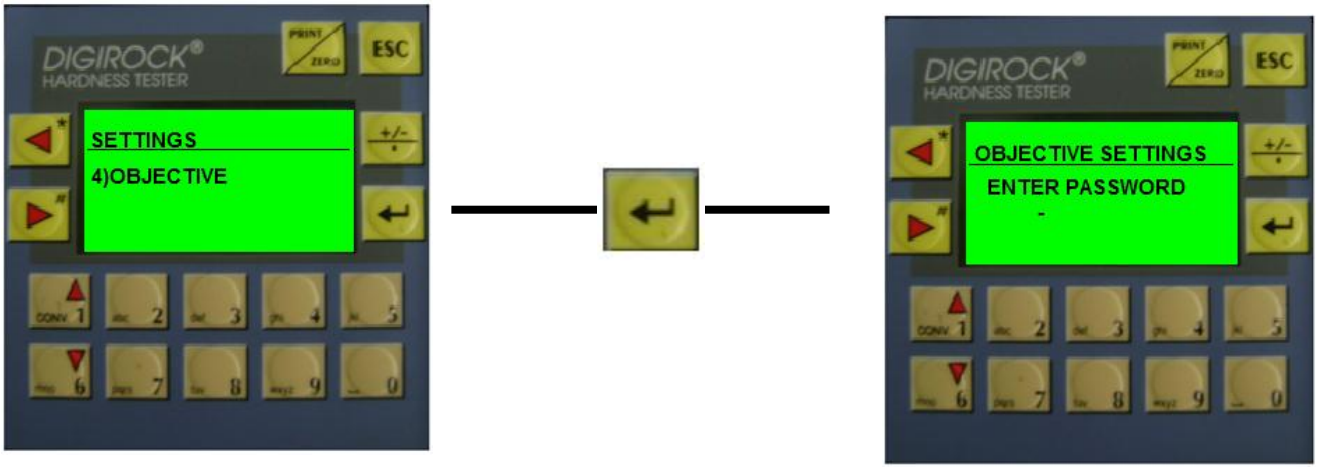
0, 4-HV 1 5-HV 3 6-HV 5 7-HV 10

When test method choosen press ESC ESC

8.Settings



1)PRINTER 2)DATE/TIME 3)LANGUAGE 4)OBJECTIVE 5)DWELLING TIME



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.)**

9.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 (6) bring indenter to the front and by raising elevating screw (3) with help of arms (5) adjust indenter tip distance approx.2 mm to test piece

5-Turn the 10X objective (13) to the front, by rotating testing turret (6) with help of arm (7) .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 (8) to the front and press down the (START) key on DIGIROCK 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 micrometer, referring to Fig.3:

Turn the micro-move handle (33) so that the 0 division line of micrometer is tangent to one angle of the indentation, see Fig.3 and Fig.4.

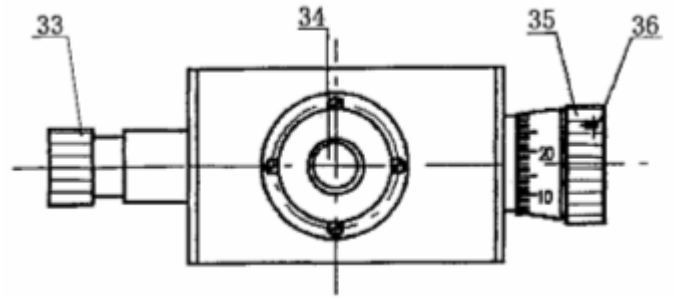


Fig.3

c) Turn the centigrade cylinder (35) so that the other longer division line is tangent to the other angle (see Fig.5).

d) Read the value on micrometer .

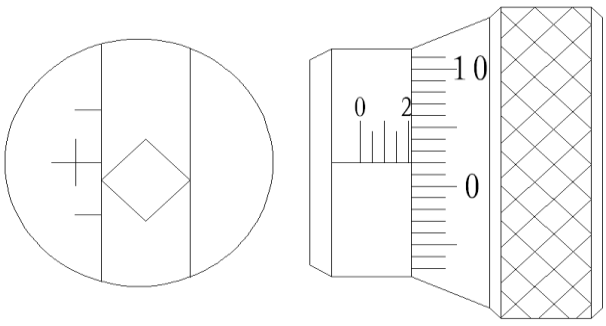


Fig.4

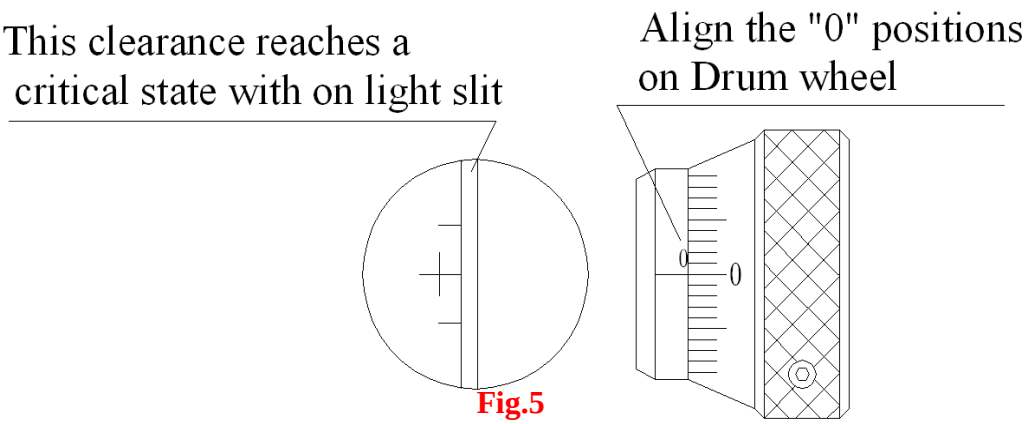


Fig.5

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 , (in Fig.4) every line is accepted as of 100 units.5X100 units= 500 + 18 lines on micrometer (in Fig 3).= 518 units. Input 518 for 1.Point on DIGIROCK panel.Read second vale by turning 90 ° of eyepiece and input 518 for 2.Point and and press  An see result on panel .(see main screen of DIGIROCK)

Note :
The coincidence of 0 division line of micrometer and zero line of centigrade cylinder (35) shall be corrected at random during the test process. If not coincident, loose the three screws (36) on the centigrade cylinder and turn lightly the outside ring until they are coincident. And then tighten those three screws (see Fig.3).

10.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 (see Fig.6):

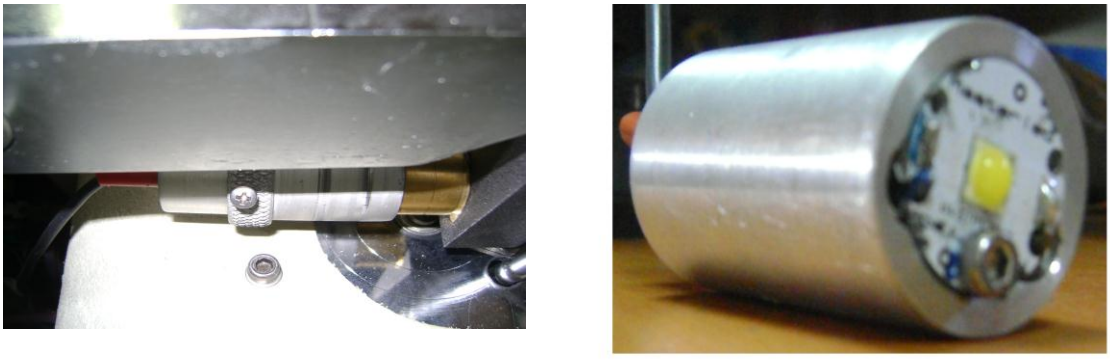


Fig.6

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.