

## DEVICE DESCRIPTION

For proper utilization of the device, please read the manual carefully to familiarize yourself with the capabilities of the device and the way of using it.

SHAAB D1 is a full automatic enhanced rebound type hardness tester based on ASTM A956-06 standard.

It is rapid and robust. It measured the hardness of the metallic material without conventional LEEB devices restrictions. Also is able to measure and display hardness in LEEB scale as well as HRC, HRA, HRB, HB, HV, HSc and TS in less than one second

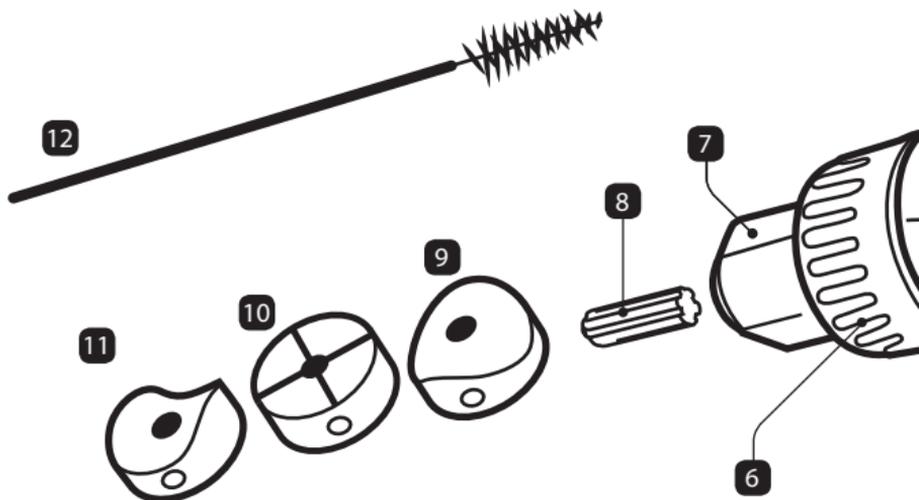
And no need to hand charging.

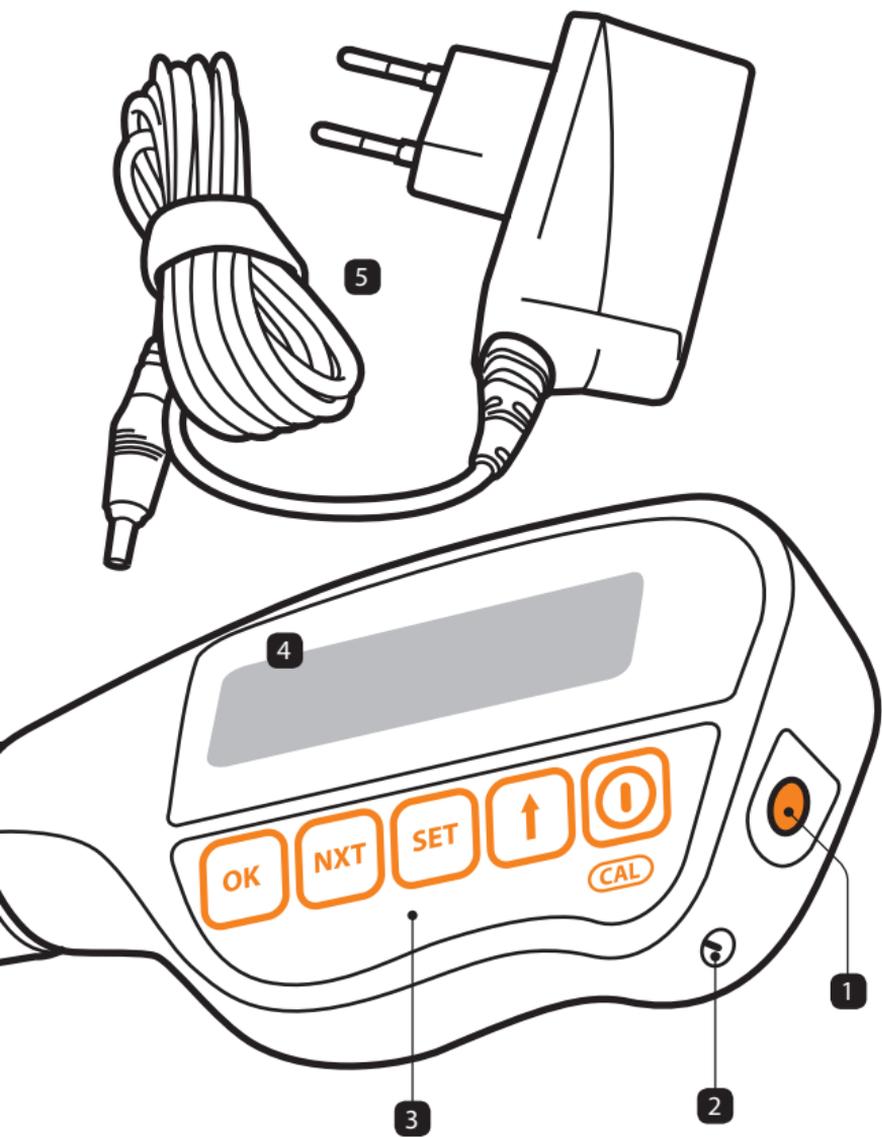
Minimum (Min), Maximum (Max) and average value for up to nine consecutive test is calculated and stored. Also this device is able to be calibrate by reference hardness blocks.

SHAAB D1 is equipped with the smallest pitcher (impact device) and impact body between similar devices which can be separate from the main apparatus in order to operate in confined space. It also utilizes electromagnetic energy instead of spring force.

## SYSTEM COMPONENTS

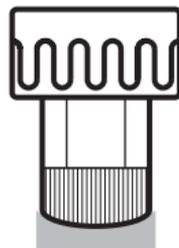
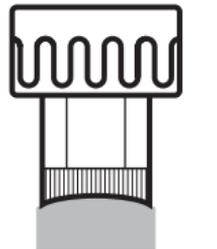
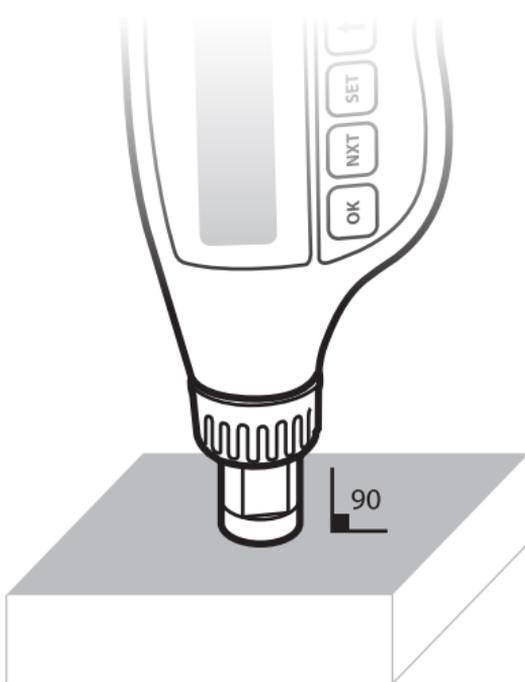
- 1 Test switch
- 2 Battery charger socket
- 3 Key pad
- 4 Display
- 5 Battery charger
- 6 Impact device holder screw
- 7 Impact device
- 8 Impact body
- 9 Concave cap
- 10 Flat cap
- 11 Convex cap
- 12 Cleaning brush

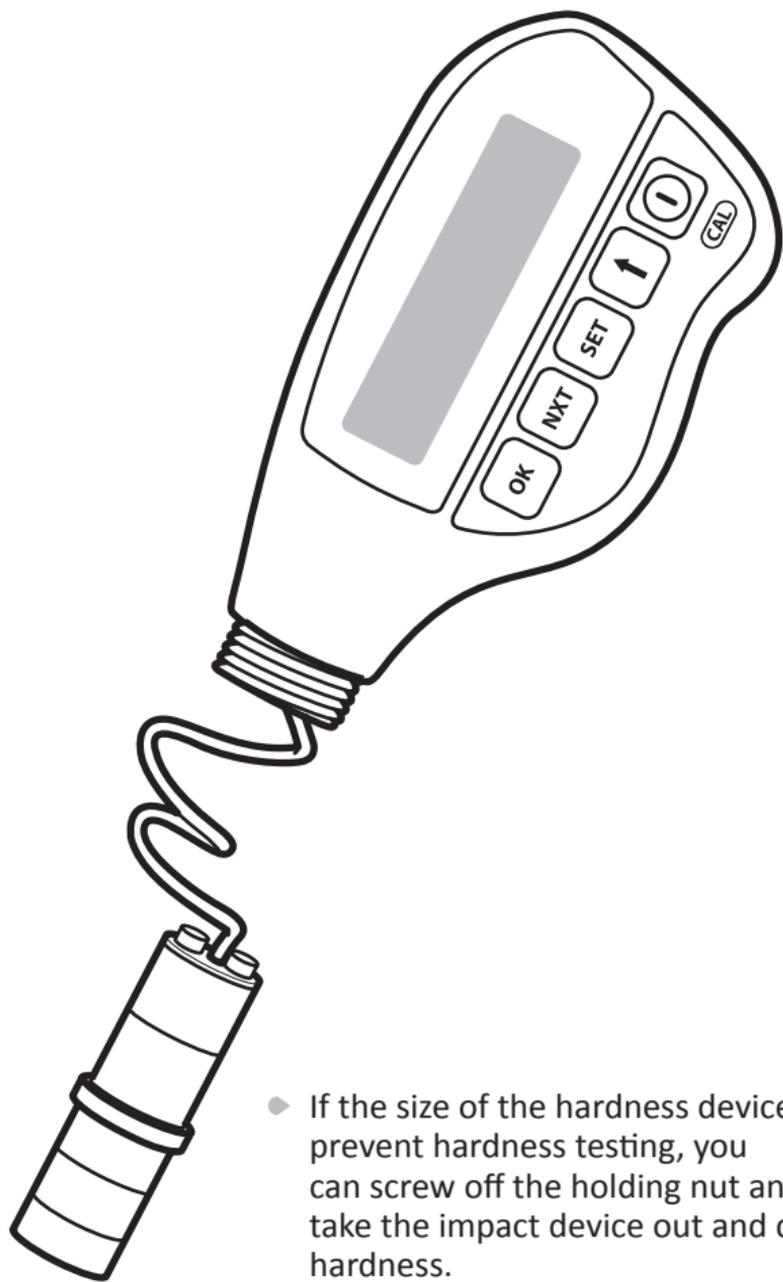




## PREPARATION AND TEST CONDITION

- Before hardness testing remove the oil and debris from the surface and then polished out with the appropriate tool.
- During Hardness testing, set the metal cap at the end of the impact device (the pitcher) completely on the test surface.
- According to the work piece shape, you can use the convex or concave cap.
- The hardness testing should not be more than one point once. The interval of tests should be more than two and a half times the impression diameter.

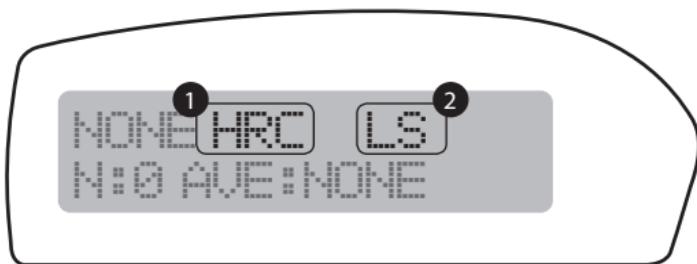




- ◆ If the size of the hardness device prevent hardness testing, you can screw off the holding nut and take the impact device out and do hardness.

## INSTRUCTIONS FOR USE OF THE DEVICE

**①** : Turn the device on by pressing the button **①** for 2 seconds. to turn off, keep the button pressed for 5 seconds. On the other hand the device is turned off automatically after 4 minutes it is also no use. Immediately after turning on the device's main page is displayed. Please select your desired scale before testing **①** (HRC-HB-HV....) Since the method of LEEB hardness is related to the type of metal because of deferent young's modulus, should also choose the type **②** (LS-HS-AL....)



**Main Page:** scale **①** ,Type of metal **②**

**SET** : By pressing the **SET** button, the settable item will start flashing **①**. Now change the flashing item by pressing the arrow key **↑**. pressing again the **SET** button will shift the flashing to another item **②**.press the **OK** button to save the final changes and exit. Remember that in flashing mode the device is not able to test.

LEEB scale (HLD) directly measured in this device, the device is able to convert the LEEB quantity to another hardness scales.

The following scales can be measured:

Brinell (HB) / Vickers (HV) Rockwell C (HRC) / Rockwell B (HRB) / HSc (shore).

These metals type in the device are considered:

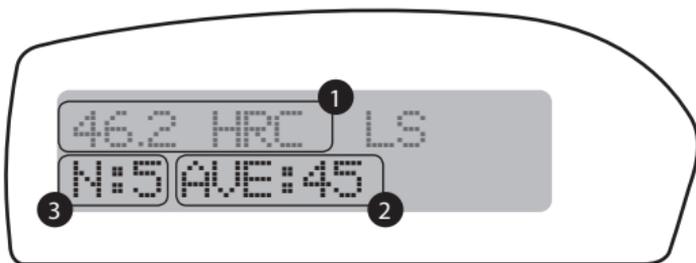
(LS) low alloy steel / (HS) high alloy steel/ (BS) Brass / (AL) aluminum / (GG) gray cast iron / (3G) ductile / (cu) copper.

The following table will give you useful information:

	HLD	HB	HV	HRB	HRC
LS	900-200	647-80	940-80	99.5-41	68.0-0
HS	840-300	None	898-80	None	67.1-20.4
GG	630-360	334-93	None	None	None
3G	658-400	387-131	None	None	None
AL	700-300	198-25	None	None	None
BS	550-200	173-40	None	None	None
Cu	690-200	315-45	None	None	None

Scales and Metals table

By pressing key ①, test can be performed immediately. The quantity measured by the device and average of the tests (Ave) and the number of tests (N: 1 ~ 9) will be displayed on the main page.



**Main page:** ① scale , ② average and ③ number of tests

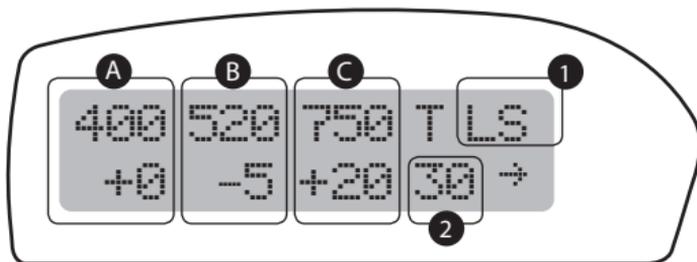
**OK** : If the **OK** button is pressed, last Measurement result, deletes from display. That way you can at any time review the previous results. By pressing **↑** , you can see the maximum (Max), minimum (MIN) and number of tests (N). press **OK** button to back to main page. Pressing **NXT** in the main page, will delete all measurement results.

## CALIBRATION DEVICE

If the measured hardness is out of the hardness zone of standard block, Device calibration is required. Calibration can be performed In LEEB scale. Each metal type (LS-HS-GG....) has its independent calibration page.

Choose your metal type in main page then press **CAL** key and enter to calibration page. There is 3 column: **A** for soft, **B** for mean and **C** for hard zone. It's better to use suitable hardness standard block or blocks. After testing and specifying the error value, write the hardness value showed by device in the up row and the error value in the low row. If there was already a quantity please sum the digits. Press **OK** to finish the calibration.

Pressing **CAL** moves the cursor. Pressing **↑** changes the value and the direction of the horizontal arrow (at the low-right side of display) will determined increase or decrease. Don't change the value by the left side the horizontal arrow, it determined the shooting velocity and is set by the manufacturer. Don't forget to press **OK** Remember that the device has a separate calibration page for each metal type (LS-HS-.....)



Calibration page

## TAKING CARE OF DEVICE

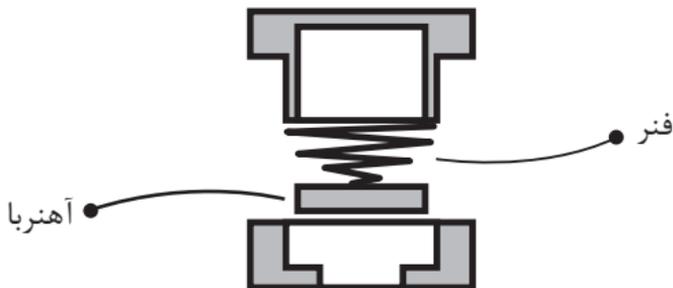


If the device is not in use for more than a week, please fully charge the battery and don't leave the device with empty battery.



Keep Away from the workplace contaminants such as oil, gasoline and Keep the device in fabric anti dust bag or box.

For cleaning the impact device (pitcher) tube first open the cap and eject the impact body, then Clean with the Brush or brush and oil ore alcoholic cleaner. If you open the pitcher for cleaning, to close Again, be careful of the arrangement of components.



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## TEST FAILED MESSAGE

- 1, NONE message indicates that the scaled desired doesn't match to the metal type or the quantity of measured test is out of the range.
- 2, E message in the corner of the main screen shows Battery system is weak and needs charging.
- 3, TEST FAILED indicates that an error in testing or setting has occurred or the impact device (pitcher) need to be cleaned.



پیغام خطا NONE و پیغام E

