



www.insize.com



PORTABLE LEEB HARDNESS TESTER OPERATION MANUAL



Specifications

- Accuracy: ±6HLD(HL = 800),
- Resolution: 1HLD, 1HV, 1HB, 0.1HRC, 0.1HRB, 0.1HRA, 0.1HS, 1SGM
- Display: Backlit LCD display
- Impact direction: full Angle measurement
- Hardness scale: HL/ HRC / HRB / HB / HV / HS / HRA / MPa
- Measuring range: HL100-960 / HRC0.9-79.2 / HRB1.2-140 / HB1-1878/ HV1-1698 / HS0.5-128 / HRA7-88.5/SGM(m)24-6599N/mm²
- Memory: 999 data can be saved and re-readable
- Statistics: Average / Max. / Min. / S. value
- Power supply: AA battery *2, With power display
- Interface: RS232 interface is used to connect computer
- Operating environment: -10~45°C
- Dimension (L x W x D): 145 x 68 x 28mm
- Weight: 158 g
- Standard: ASTM A956, DIN 50156, GB/T 17394-1998

Applications

- Hardness tests on installed machines or steel structures: e.g. on heavy and large work-piece or on permanently installed system parts.
- Rapid testing of multiple measuring areas for examination of hardness variations over larger regions.
- Measuring hardness for produced parts at production line.
- Identifying metallic material stored in a warehouse.
- Ineffectiveness analysis of permanent parts, pressure -vessel, turbo generator.

Instrument outline and description

1 Instrument graphic



2 Impact body device type



3 Characteristics of various impact devices

Type	Brief description	
D	Universal standard unit for majority of hardness testing assignments.	
DC	Extremely short impact device, other specs identical with type D.	
	Application:	- highly confined spaces - holes and cylinders - internal measurements on assembled machines
D+15	Slim front section	
	Application:	- grooves and recessed surfaces.
DL	Extremely slim front section	
	Application:	- extremely confined spaces - base of grooves
C	Reduced impact energy (compared with type D).	
	Application:	- surface hardened components, coatings - minimum layer thickness: 0.2mm. - thin walled or impact sensitive components (small measuring indentation).
E	Synthetic diamond test tip (approx.5000 HV)	
	Application:	- extremely high hardness measurement such as high carbon steel up to 1200 HV
G	Increased impact energy(approx. 9 times that of type D)	
	Application:	- Brinell hardness range only - heavy cast and forged parts with lower demands on surface finish.

Symbol description

1 Characteristics of various impact devices

symbol	Meaning	symbol	Meaning
HL	Leeb hardness value	HS	Shore hardness value
HB	Brinell hardness value	HV	Vicker hardness value
HRB	Rockwell B hardness value	SGM	Intensity of tension
HRC	Rockwell C hardness value		

Preparation before Measuring

Requirements for the sample

- 1.The surface temperature of sample should be less than 120 °C
- 2.The samples must feature a metallic smooth, ground surface, in order to eliminate erroneous measurements brought about by coarse grinding or lathe scoring. The roughness of the finished surface should not exceed 2µm.
- 3.Requirements for the weight of the sample.
For samples weighing over 5 kg and of compact shape, no support is needed. Samples weighing between 2-5 kg, and also for heavier samples with protruding parts or thin walls, should be placed on a solid support in such a manner that they do not bend or move by the impact force.
- 4.Samples weighing less than 2 kg should be firmly coupled with a stable support weighing over 5 Kg.

For the coupling operation, the following prerequisites must be fulfilled:
Contact surface between the sample and the base plate must be flat, plane parallel and ground.
The direction of the test impact must be perpendicular to the coupled surface.
Minimum thickness of the sample for coupling undervarious impact devices are shown in following table:

Types of impact devices	Minimum thickness
D/DC, D+15, DL, E	3mm
G	10mm
C	1mm

5.Surface -hardened steels and especially case-hardened steels produce L-values which are too low when case-hardening depth is small because of their soft core. When measuring with impact device D the depth of the hardened layer should be no less than 0.8 mm.

6.The specimen should not be magnetic.

7.For test sample of curving surface, where the radius of curvature R is less than 30mm, a small support ring should be applied.

8.Requirement on sample weight using various impact devices

Types of impact devices	Classification of samples		
	Heavy-weight	medium-weight	light-weight
D/DC, D+15, DL, E	>5kg	2-5kg	0.05-2kg
G	>15kg	5-15kg	0.5-5kg
C	>1.5kg	0.5-1.5kg	0.02-0.5kg

Samples with Curved Surfaces Curved surfaces should always be tested with the small support ring.

Impact device types D/DC, D+15, C and E Rmin=30mm

Impact device type G Rmin=50mm

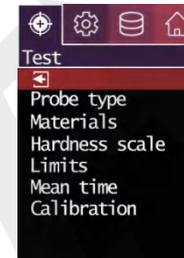
For impact devices D, DC, D+15, C and E, special support rings are available to accommodate smaller radii on convex or concave surface.

Types of impact Devices	Support Ring	Radius for Curved Surface(mm)
D/DC, D+15, C, E	Standard support ring	>60
	Small support ring	60-30
G	Standard support ring	>100
	Support Ring	100-50

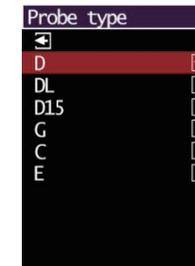
Operation

1 Turn On/Off the Instrument

2 Test Menu



3 Probe type



4 Materials



5 Hardness Scale



6 Upper/Lower Limits



7 Mean Time



8 Calibration

In the test before the standard test block to test the accuracy of the instrument, if the use of a certain period of time, the impact of body wear, the test value will produce a certain error, the test can be based on the measurement of the value of the standard block and the standard block of the actual value of the comparison of the corrections



9 Settings menu



10 Bluetooth 2.0



select BLE protocol Option. Select PRINTER to connect Bluetooth printer.

11 RF Port



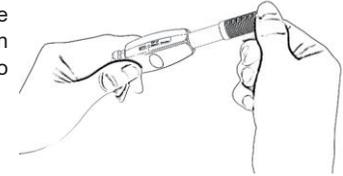
12 Database menu



When the average function is turned on: long press the left arrow key to delete a piece of data
 When the average function is turned off: long press the left arrow key to delete a page of data

Measuring Procedure

Hold the impact device with left hand while push the loading tube with right hand toward to the end. Then loose the force and let the loading tube back to original position.



Place the impact device against the object to be measured. Then press the release button on top of the impact device with finger of right hand. The measuring value will be displayed on LCD. When the tester is switched on, the tester will enter into measuring mode, and the probe will start working after loading.



Measuring Procedure

Impact devices do not require any particular care other than periodic cleaning of the impact body and the guiding tube after performing approximately 1000-2000 tests. During cleaning, the following procedures should be observed: Unscrew support ring and remove impact body from the guiding tube. Remove any dirt and metallic dust from the impact body and the spherical test tip. Clean the guiding tube with the special brush provided. Do not apply oil to any parts of the impact device.