Changing The Measuring Ring, Cleaning

The Measuring Ring can be exchanged with a small one if required to fit in tight locations. Also, the ring can be removed to for periodic cleaning inside of the mechanism.

¹Press the Measure Button.

- Release the probe from charged position.
- 2 Turn the Measuring Ring to remove it from the Main Unit (Fig. 4) and take out the Probe. ³Cleaning.
- Using the supplied brush, clean the inside of the main unit as well as the Probe to remove any dust or dirt.
- **(4)** Replace the Probe and reattach the Measuring Ring to the Main Unit. Insert the Probe in the direction shown in the drawing. (Fig. 5) Screw the Measuring Ring back on to the main body.

Installing DL-Type Probe (sold separately)

Measurement can be made in narrow spaces, such as the bottom groove of a large gear, by replacing the Probe with the DL-type Probe available for the Hardness Tester.

- **1**Press the Measure Button.
- Release the Probe from charged position.
- 2 Turn the Measuring Ring to remove it from the Main Unit (Fig. 4) and take out the D-type Probe.
- 3 Insert the DL-type Probe as shown in the drawing and attach the measurement guide. (Fig. 6)
- (4) Change "Setup Menu" \rightarrow "9. Impact device" from "D" to "DL". When switching back to D-type Probe, be sure to change the setting back to "D".

⑤Set the material and measurement scale in the "Setup Menu" → "3. Material & scale".

Meas. Range Listing by Material, Scale

D-Type Probe

Material Scale	HLD	HRC	HRB	HB	HV	HS	σΒ
1. Steel & cast st.	300-878	10.0-68.0	38.4-109.0	80-739	80-940	30.2-98.0	373-1994
2. CW tool steel	300-840	20.4-67.1	—	—	80-898	_	_
3. Stainless st. & heat resistant st.	300-800	19.6-62.4	46.5-101.7	85-655	85-802	_	_
4. Grey cast iron	360-650	—	—	90-334	—	_	_
5. Nodular cast iron	400-660	—	—	131-387	—	—	_
6. Cast aluminium	170-570	_	23.8- 84.6	19-164	_	—	_
7. Brass	200-550	—	13.5- 95.3	40-173	—	_	_
8. Bronzes	300-700	—	—	60-290	—	_	_
9. Copper	200-690	_	_	45-315	_	_	_

DL-Type Probe

Material	Scale	HLDL	HRC	HRB	HB	HV	HS	σΒ
1. Seel & cast st		560-950	20.0-68.0	38.4-99.5	80-647	80-940	32.5-99.5	373-1994
2. CW too steel		560-943	20.0-63.0	—	—	80-782	—	—

Consumable Parts Replacement

The listed components are consumables. When replacement is required, please order separately using the part numbers listed below.

	Part Name	Part No. (when sold separately)	Replacement Schedule		
Calibr Blo Measu Rir	Calibration Block	LHT-B	 Check before each use for wear which will affect accuracy When the Calibration Block surface is covered in marks and a fresh spot is not available which is at least 2x the width of a measurement mark away from any previous marks. If surface is scratched, corroded, or contaminated. 		
	Measuring Ring	LHT-BR	 Rubber on Measuring Ring wears due to repeated pressing against surface being measured. If correct measurement is not possible after Error Correction. 		
	Probe	LHT-D-S LHT-DL-S	 When worn due to repeated impacts during measurement If correct measurement is not possible after Error Correction. 		

Maintenance • Storage

Remove any dust or grime with a dry cloth. Any contamination entering inside the Main Unit will prevent smooth operation of the Probe.

Protect the Calibration Block from corrosion. For rust prevention, lightly apply anti-rust oil, or place in rust preventive bag.

Place components in provided case and store in a cool, dry location.

Keep out of direct sunlight and moisture, and please keep secure from unauthorized personnel. Improper use or storage may cause damage to product or display.

> SI Niigata Seiki Co., Ltd. 5-3-14, Tsukanome, Sanjo, Niigata, Japan, 955-0055 Tel. : +81-256-33-5522 Fax. : +81-256-33-5518

S TugaTa Jeiki PROFESSIONA

Digital Hardness Tester for Metals (Rebound LEEB HARDNESS

Thank you for purchasing the Niigata Seiki Leeb Hardness Tes This digital instrument measures the hardness of (non-magnetized) metals: steel, cast steel, tool steel, stainless steel, heat resistant steel, standard (gray) cast iron, ductile (nodular cast) iron, cast aluminum alloys, brass, bronze, and copper. Hardness is measured by impacting the surface of the sample with a test **ODECIEICATIONS** probe and measuring the rebound velocity.

- For safe and proper use of this product, please read this instruction before use and follow the procedures described. Please keep man accessible to user for future reference.
- Keep this manual with the instrument if transferred or leased to a the
- For inquiries about this product, please contact dealer or Niigata S

PART IDENTIFICATION & FUNCTION [Main Unit] 6 Measure (5) Port Cover Button ④ USB Port ⑦ Handle 3 LCD Display 000 2 Measuring Ring 10-Q-Q, 10 Down Button 9 Up Button 1) Probe 8 Power Button [Accessories] 1 USB Cable 14 AC Adapt Cleaning Brush O (13) Measuring Ring (sml.) Calib Block Storage Case Instruction Manual [Measurement Screen] (B) (K) (L)AUTO HL X H HL 419 (L)(B)(K)(E) (A)414 F D<u>x:</u> <u>st.& cast st.</u> A001 (M) 075% Standard () (1)(H) Large Readout Display Display



1 Probe (Fig. 5) Measurement guide

*Before cleaning, or replacing the Measuring Ring,

1000

Threads

make sure the power is turned OFF.

Tighten

2 Measuring Ring

Loosen

2 Measuring

Ring

(Fig. 4)

AL.	Instruction Manual		
d Type)	Model No.	LHT-400plus	
TEST	ER		
ter.			

n manu	al Acci	uracy:within ±19HL
ual whe	ere it is Ope	rating Temperature $: 0 \sim 40^{\circ}$ C
	●Wei	ght: Main unit:90g
nird nar	•Data	a Storage:Max. 2,000 sets
	•Auto	Power Off: 1, 2, 5 min., or disabled
eiki.	●Con	tinuous use time : \sim 16 hr on full charge
	(1)Probe	Impactor which strikes surface during
		measurement.
	⁽²⁾ Measuring Ring ····	Pressed to surface during
	3LCD Display	For display of measurements and
		Connacto to included LISP coble for
2	903B FUIL	charging and data output
P	5 Port Cover	Cover for LISB Port, Please keep
		closed when not in use.
	6 Measure Button	Press to release Probe and trigger a
		measurement.
	⑦Handle	Move down to position Probe for
		measurement.
	8 Power Button	Power ON/OFF, and menu select button.
	<pre>⑨Up Button ·······</pre>	Button to select a setting, and to
		control display size.
	10 Down Button	Button to select a setting, and to
		delete last measurement.
		Connects for charging Main Unit and
		transferring data
	Departing Pruch	For cleaning incide of Main Unit
		Por cleaning inside of Main Onit.
	(sml)	nlaces
		Charges Main Unit via the USB
er	Ono noapter	Cable.
	(15) Calibration Block	Test Block of specified hardness for
	0.000	checking, and calibrating unit before
		each test.
	Storage Case ····	Storage case for Main Unit and
		accessories.
ration	Instruction Manual ···	This user guide.
<u> </u>		
	(A) Scaledt / Ave	rage (H) Battery Charge Level
	(B) Scale	(I) No Measurements / Total
	(C) Measurement	Material Setting
\sim	D Maximum	K High • Low Limit Exceeded
Ç	(F) Minimum	(H) (L)
419		L Memory Auto / Off
N	G Docard Numb	
ノ		(M) Probe Type
	Press the	Up Button (A) to togale

between Standard and Large readout.

SAFETY PRECAUTIONS

Please Observe

Always follow the procedures specified below in order to prevent harm to yourself or others, and to prevent damage to property.



WARNING Indicates risk of personal injury or property damage if not followed.



Read the manual and follow all instructions.

· Use of product other than as described in the manual may cause accident.

Use only for measuring hardness.

• Use for any purpose other than measuring may damage or wear the instrument. Improper use may also cause accident.

Use in an environment which meets the following conditions: •Keep away from direct sunlight.

•Keep in dry location protected from rain and water.

- Protected from use by children and unauthorized people.
- · Use in location contrary to the above may cause poor accuracy, damage to the product, or may result in accident or injury.

Handle With Care.

· Do not drop or subject to shock, do not place under heavy objects. Damage may cause failure or poor accuracy.

Preparation of Test Surface

The workpiece and measured surface must meet the following conditions.

1 Mass: 5kg or more

- *For workpiece weighing between 2 and 5 kg, or for thin and easily deformed parts, place on a surface plate or stable surface of more than 5kg
- *For workpiece weighing less than 2kg, secure it to a surface plate of more than 5kg using a coupling agent, such as petroleum jelly, with a tight fit to stabilize.

2 Thickness: 3mm or greater

3Surface Roughness: Ra 2μ m or less

%If surface is rougher than Ra 2 μ m, please polish to meet specification.

4 Radius of Curvature: greater than 30mm

5 Test site must be 5mm or greater from edge of surface.

6Surface Temperature: 80°C or less

⑦For testing surface hardness, a hardened surface thickness: 0.8mm or greater

®Not Magnetized

*Be sure to demagnetize if there is any residual magnetism.

9Bare (unpainted) Surface

%If sample is painted, remove any paint or coating before test.

¹⁰Not easily fractured, or damaged by the surface indents resulting from the test

%This instrument measures hardness by impacting a probe, with a hardness of HLD 1600, against the test surface. Please note: after testing, some small dents will remain on workpiece.

Charging

The Main Unit contains a rechargeable battery. When power level drops below 20%, please charge as follows.

①Connect with the provided USB Cable Connect to the AC Adapter using the included USB cable.

2Plug in the AC adapter

Plug the AC adapter into the power mains (100V AC).





Denotes a prohibition Denotes a requirement -You MUST NOT do You MUST do

Not for use on materials which are easily fractured, or which will be damaged by the dents created during tests. •This instrument measures hardness by impacting a probe. with a hardness of HLD 1600, against the test surface. Please note: after testing, some small dents will remain on workpiece.

Do not use on magnetized material or in presence of magnetic fields.

· Hardness is measured based on rebound speed of the Impact Probe. If magnetic field is present, the rebound speed may be affected and a precise measurement is not possible.

Do not dryfire instrument.

· If test is performed without test surface under probe, the instrument may be damaged and affect accuracy.

Do not Modify or disassemble beyond the procedures described in this manual.

· It may damage product or affect accuracy. For service, please contact distributor.

Accuracy Confirmation • Calibration

Instrument accuracy will be affected by shock or Probe wear. Please check accuracy and calibrate before each use using the supplied Calibration Block.

(1)Confirm the hardness written on Calibration Block

The hardness of the calibration master is marked on the block surface. %For D-type Probe ... HLD value, For DL-type Probe ... HLDL value.



Block hardness

②Measure the Calibration Block hardness

Use the "Hardness Test Procedure" on the following page to test the hardness.

Material = Steel ●Scale = HLD/HLDL ●No. of Meas. = 5

<Calibration Block Usage Notes>

- · Do not use a re-ground Calibration Block.
- · Make sure the surface of Calibration Block is clean before use.
- · Do not use the back surface of the Block.
- · Do not measure on the edge 4mm of surface.

• When measuring, use spot at least 2x the width of the measurement marks away from any existing marks.

*A mark will be left on surface after each measurement. If you measure again at the same location, the effect of the

mark will cause a measurement error.

3Error Correction

- %If the measured hardness from step (2) is within \pm 19HL of the hardness from step 1, then the accuracy is confirmed within the quaranteed range and the instrument is ready to use.
- %If the measured hardness from step (2) is NOT within \pm 19HL of the hardness from step 1, then the calibration must be adjusted. Enter the measurement error In the "Setup Menu" → "6. Calibration" as shown in the following page.

Power ON / OFF

- **Power ON**.....Press the Power Button (1). The power will turn on and the Measurement Screen will display on the LCD.
- **Power OFF**.....From the Measurement Screen, press and hold the Power Button for 3 seconds. Power and LCD will turn off

Hardness Test Procedure

Follow the steps below for a basic hardness test

1Turn the power ON.

- Press the Power Button (1) to turn on the power.
- ⁽²⁾Set the material and measurement units.

Specify the workpiece material and desired scale units in the "Setup Menu" \rightarrow "3. Material & Scale" After entering the settings, select "1. Measurement" to return to the Measurement Screen.

³Press the Measuring Ring against the surface.

Make sure the workpiece and test spot meet the conditions listed in the section "Preparation of Test Surface", and press the Measuring Ring onto the surface. *Make sure there are no scratches or marks from previous measurements.

(4) Push down on the Handle, and then pull it back up. (Fig. 1)

Push down on the Handle to charge the internal probe for the test, then lift the Handle to bring it into position for the test.

- %Be careful not to push down on the Measure Button when pushing down on the Handle
- *Make sure you hold the Handle secure while bringing it up to the top. If the Handle slips, it may return with a shock and cause damage.

5 Press the Measure Button. (Fig. 2)

With the Measuring Ring held firm to the surface, press the Measure Button. The Probe will release and impact the surface. Hardness will be calculated from the rebound velocity.

*Be careful not to push down on the Handle when pressing the Measure Button, it will cause inaccurate readings.

6 Repeat the measurement in steps 4~5.

Repeat the measurement $3\sim5$ times to allow an average to be calculated. The number of measurements averaged can be changed, please refer to section, "Setup Menu" \rightarrow "2. Average Times" below.

The measurements are displayed. (Fig. 3)

The average value, maximum reading, and minimum reading are displayed on the I CD display.

Setup Menu

When power is ON, pressing the Power Button (1) will display the Setup Menu screen. Within the Setup Menu, the Up and Down buttons (A) (are used to select items and to change values, and the power button (1) is used to enter the selection.

1. Measurement ···· Return to the Measurement Screen.	
2. Average times ··· Change the number of measurements averaged for each •Range: 2~8 •Recommendation: 3 or more •For general	rea al u
3. Material & scale ···· Specify the workpiece material, and set the measurement When specifying the material and scale, options are stars of select as required.	nt ho
Back Page: Meas. Range Listing by Material, So	cal
 4. Tolerance To set up tolerance function. Press Up Button (a) to cl the value, and Down Button (b) to move to next digit. "H" or "L" will appear on the display for readings above below the set limits. 	ha e c
5. Memory Control the storage of measured data.	
1. Memory ···	
Yes- Will save the data in the destination specifie the File setting.	ed
No - Measurement data will not be saved.	
2. File Setting ···	
Specify the storage destination for the measurements groups, A to J, can be stored with 200 Measurement se	. T ets
Delete data from the specified group.	
4. Delete ···	
Clear the measurement data stored in the Main L	Jni
6. Calibration Correct the measurement by entering the error value determined in the accuracy check from the "Accuracy Confirmation • Calibration" section on the previous pa	ge
7. Auto shutdown ···· Select the time for Auto power off feature – 1min., 2mi 5 min., or disabled.	n.,
8. Contrast Adjust the contrast of the display.	
9. Impact device Set parameters to match the type of probe	
Back Page: Installing DL-Type Probe (sold separat	el
10. Languages	
11 Default	
I I BOILDIN I IESIOIE AII SEILIIIYS IO IACIOIY UEIdUIL.	





MAX

MIN

as specified *Please do not delete any of the folders.

as specified

All folders besides DATA are system folders

The maximum value for the 1~8 measurements

The minimum value for the 1~8 measurements