Mikrosize-iRock-150WL
Digital Rockwell Hardness Tester

Instruction Manual



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Notes

1.Before using the instrument, please read the"Instruction Manual"carefully to understand the operation steps of the instrument in detail.and precautions to avoid equipment damage or safety accidents due to improper use.

2.When installing and debugging the instrument, please carefully remove the cable tie and shockproof tape.

3.The power socket of the instrument must be a single-phase three-core socket, and the ground terminal must meet the specified protective grounding requirements.

4.It is strictly forbidden to disassemble and install the electrical components and switch sockets of the instrument by yourself. If they are disassembled without authorization, an accident may occur.

5.During the process of applying or removing the test force and maintaining the test force, do not turn the variable load handwheel or the rotary wheel.

6.This unit is committed to improving the quality of the hardness tester and constantly updating the structure.

The content described is slightly different from the structure of the instrument without prior notice, please forgive me.

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1. Brief Introduction

1.Hardness is one of the important indicators of material mechanical properties, and hardness test is an important means to judge the quality of metal materials or parts. Because the hardness of metals has a corresponding relationship with other mechanical properties, most metal materials can be used to approximate other mechanical properties, such as strength, fatigue, creep, and abrasion, by measuring the hardness.

2. Digital Rockwell hardness tester with a novel large-screen display, with good reliability, operability and intuitiveness, is a high-tech product integrating electrical and mechanical functions. Its main functions are as follows.

2.1 Selection of rockwell hardness scale

2.2 Selection of plastic rockwell scale (special requirements, supply according to contract)

2.3 Hardness conversion between hardness.

2.4 Print out the hardness test results.

2. Technical Parameters

1 Initial Test force:98.07N(10kg) allowance±2.0%

2 Total test force:588.4N(60kg),980.7N(100kg),1471N(150kg) allowance±1.0%

3 Indenter Specification;

3.1 Diamond rockwell head

3.2φ1.5875mm ball indenter

4 Input voltage:AC230V±5%,50~60Hz

5 Delay control:1~60s adjustable

6 Maximum height allowed for tested parts:210mm

7 Distance between center of head and fuselage:155mm

8 Dimensions of hardness tester:L×W×H:520×240×720(mm)

9 Net Weight: 80KG

10 Rockwell hardness test scale, pressure head, test force and application range(Chart 1)

Scale	Indenter type	Initial test force	Total test force(N)	Application
HRA	Diamond indenter	98.07 N (10kg)	588.4(60kg)	Hard alloy, carbide surface quenching steel, hardened steel plate
HRD			980.7(100kg)	Thin steel plate, surface hardened steel
HRC			1471(150kg)	Quenched steel, quenched steel, chilled cast iron
HRF	Ball indenter φ1.5875mm (1/16″)		588.4(60kg)	Cast iron, aluminum, magnesium alloy, bearing alloy, annealed copper alloy, thin and soft steel plate, etc
HRB			980.7(100kg)	Mild steel, aluminum alloy, copper alloy, malleable cast iron, annealed steel
HRG			1471(150kg)	Phosphor bronze, beryllium bronze and malleable iron
HRH	Ball indenter φ3.175mm (1/8″)		588.4(60kg)	Aluminum, zinc, lead, etc
HRE			980.7(100kg)	Bearing alloy, tin, hard plastic and other soft materials
HRK			1471(150kg)	

Chart 1

2. Technical Parameters

11 The hardness gauge shows allowable errors(Rockwell hardness test is commonly used for A, B, C three scales)(Chart 2).

Hardness Scale	Hardness range of standard blocks	Maximum allowable error of indication
HRA	(20 ～ 75)HRA	±2HRA
	(> 75 ～ 88)HRA	±1.5HRA
HRB	(20 ～ 45)HRB	±4HRB
	(> 45 ～ 80)HRB	±3HRB
	(> 80 ～ 100)HRB	±2HRB
HRC	(20 ～ 70)HRC	±1.5HRC
HRD	(40 ～ 70)HRD	±2HRD
	(> 70 ～ 77)HRD	±1.5HRD
HRE	(70 ～ 90)HRE	±2.5HRE
	(> 90 ～ 100)HRE	±2HRE
HRF	(60 ～ 90)HRF	±3HRF
	(> 90 ～ 100)HRF	±2HRF
HRG	(30 ～ 50)HRG	±6HRG
	(> 50 ～ 75)HRG	±4.5HRG
	(> 75 ～ 94)HRG	±3HRG
HRH	(80 ～ 100)HRH	±2HRH
HRK	(40 ～ 60)HRK	±4HRK
	(> 60 ～ 80)HRK	±3HRK
	(> 80 ～ 100)HRK	±2HRK

Chart 2

3. Installation

1 The working conditions of the hardness tester

1.1 At room temperature in the range of 10 to 30 degrees Celsius;

1.2 Indoor relative humidity should not exceed 65%;

1.3 In a vibration-free environment, there is no corrosive medium around;

2 Unbox the hardness tester

2.1 Remove the 4 screws that fix the box, lift the box, and take out the pad and accessory box of the protective ring hardness tester;

2.2 Raise the bottom plate, use a wrench to screw out the 2pcs M10 bolts under the bottom plate, the hardness tester and the bottom plate off, lift the hardness tester (handle with care).

2.3 After unboxing, the hardness tester is horizontally placed on a stable workbench, and its level does not exceed 1mm / m. At the same time, make holes in the appropriate position of the table (Figure 1), so that the lifting screw can work normally.

3 Placement of hardness tester(Figure2)

After the hardness tester is properly placed, open the upper cover (1) and the rear cover (2). Unfasten the white gauze strap on the extension rod (22) inside the body (Figure 6), and remove the white gauze strap that fixed the moving parts, and then cover it to prevent dust from entering.

4 Installation of weight group(Figure 3)

4.1When installing the weight, the instrument should be in the state of removing the test force.

4.2Take out the weight group in the accessory box and clean it.Turn the variable load handwheel (9) to 588 and remove from the back cover

3. Installation

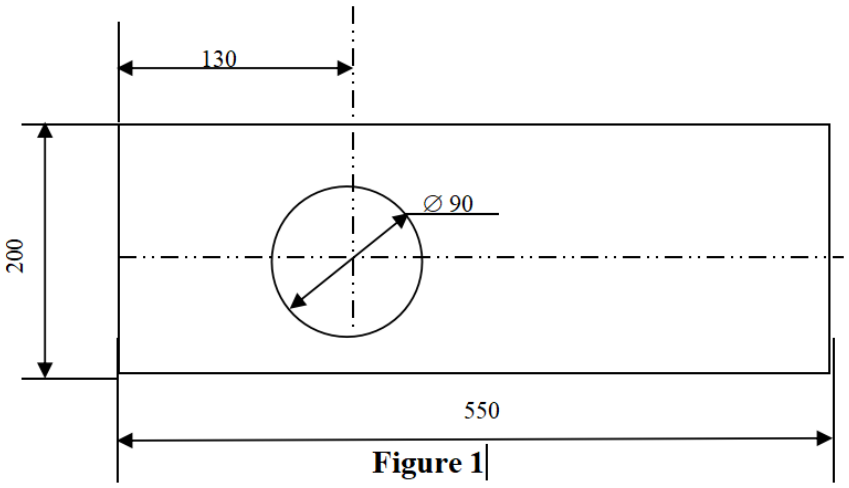


Figure 1

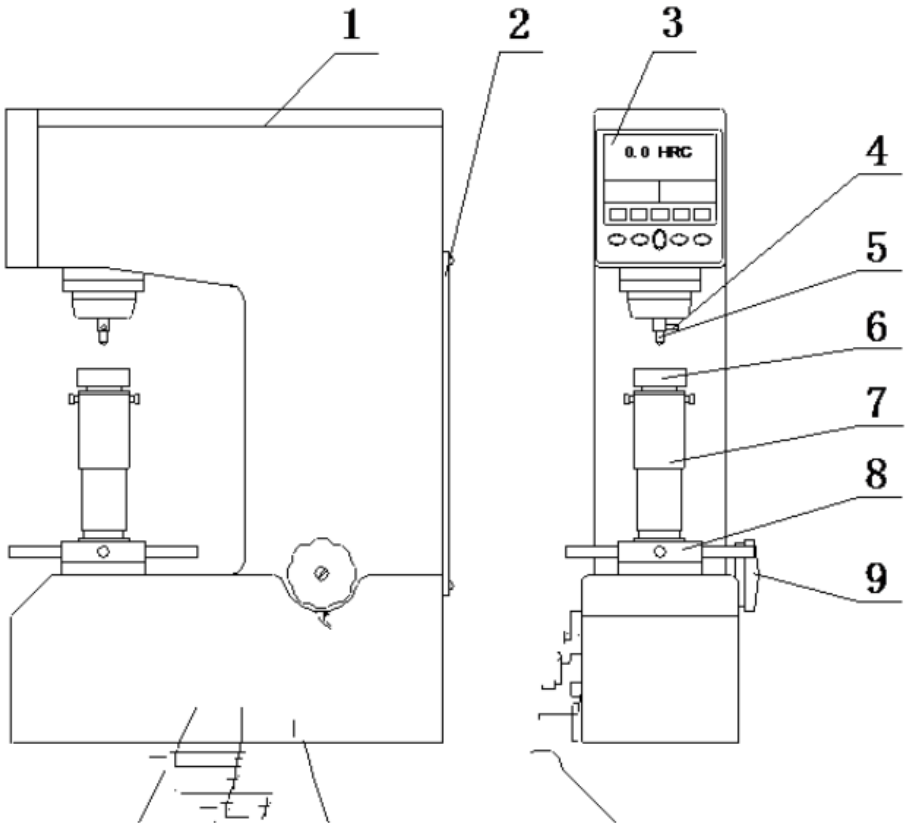


Figure 2

1.top cover

2. rear cover

3.display screen

4.Head tightening screw

5. indenter

6.testing bench

7.lifting screw 8.spinning roller

9.Variable load handwheel

3. Installation

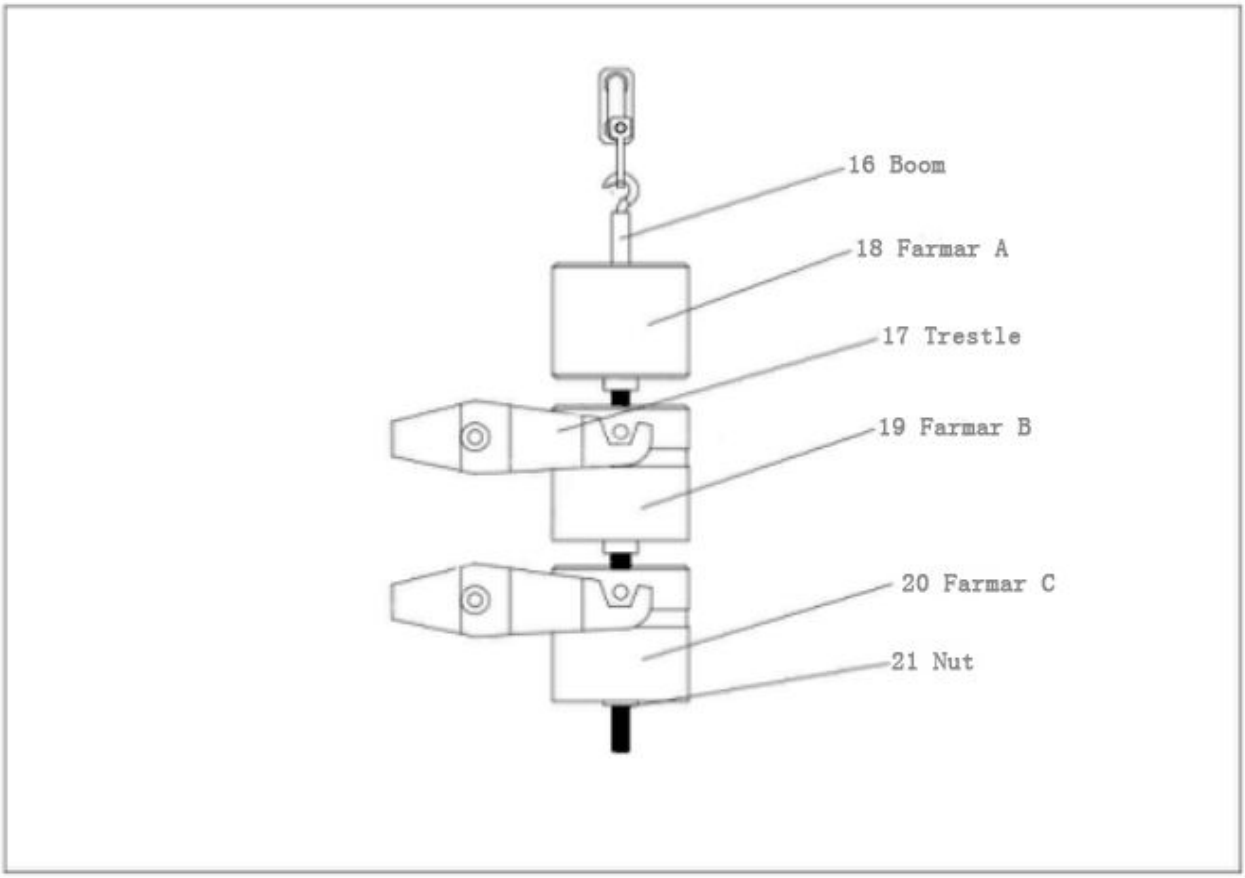


Figure 3

Hang the assembled weight assembly into the lifting lug at the end of the derrick hook lever

5 The corresponding relation between test force and weight selection(Chart 3)

Scale	Test force(N)	Variable charge hand wheel score	Weight bearing(Farmar code)
HRA	588.4(60kg)	588	Boom+Farmar A
HRB	980.7(100kg)	980	Boom+Farmar A+Farmar C
HRC	1471(150kg)	1471	Boom+FarmarA+FarmarB+ Farmar C

4. Panel Key Function Introduction

1 Plug in,Turn on the boat switch,home screen display"welcome",wait 5 seconds,The user interface appears on the home screen（Figure 4）



Figure 4

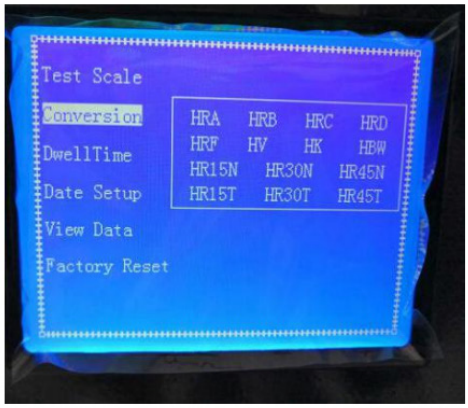


Figure 5

1.Clear--Place the cursor on this key,After the test is completed, the main screen shows that the hardness zone may leave decimals. Then press OK and the number in the hardness zone will be zero.(0.0HR30N).

2.Set--Press ◀ ▶ to move the cursor over the Set key,Press OK,Screen shows set item(Figure5),Press ◀ ▶,Move the cursor up and down optionally:Test scale、Conversion、Dwell time、Date setup,View Date and Factory reset. Press + - to change the number，press OK after selecting，the home screen returns to the desired interface.

3.Del—move the cursor over this key，press OK，Delete the hardness data from the last test.

4.4 Print—move the cursor over this key（The first point is not printed）,press OK,print out. Content include:yyyy、mm、dd、error range、AVG、Min.value.Max. value、hardness value and times etc.

5.Rockwell hardness scale selection, a total of 21 rulers to choose from

6.Hardness conversion between hardness

7.Selection of total test force and charge holding time（The default is 5 seconds）

Revise year, month, day and time

View test data

Enter restore factory setting parameter, this function needs factory setting.

5. Proper use of Hardness Tester

1.Preparation before use

1.1.The surface of the test piece should be flat and clean, and there should be no dirt, scale, pits and significant processing marks. The support surface of the sample and the test bench should be clean to ensure good adhesion.

1.2.The minimum thickness of the test piece shall be greater than 10 times the depth of the indentation. After the test, there must be no visible deformation marks on the back of the test piece.

1.3.The test piece shall be stably placed on the test bench. The test piece shall not be moved during the application of force, and the test force shall be applied vertically to the test piece.

1.4.Select the appropriate test bench according to the shape and size of the test piece. If the test piece is irregular, you can make a special fixture according to the specific geometry to make the hardness test value correct.

1.5.When the test piece is cylindrical, a "V" type test bench must be used. When the diameter of the test piece is less than 38 (25) mm, the test results shall be corrected, and the correction values are all positive values. Correction value of Rockwell hardness scale for cylindrical test pieces(Chart 4)

5. Proper use of Hardness Tester

Hardness value HR	Diameter of cylindrical specimen（mm）								
	6	10	13	16	19	22	25	32	38
	The correction of the rod A,C and D （HR）								
20				2.5	2.0	1.5	1.5	1.0	1.0
25			3.0	2.5	2.0	1.5	1.0	1.0	1.0
30			2.5	2.0	1.5	1.5	1.0	1.0	0.5
35		3.0	2.0	1.5	1.5	1.0	1.0	0.5	0.5
40		2.5	2.0	1.5	1.0	1.0	1.0	0.5	0.5
45	3.0	2.0	1.5	1.0	1.0	1.0	0.5	0.5	0.5
50	2.5	2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5
55	2.0	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0
60	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0
65	1.5	1.0	1.0	0.5	0.5	0.5	0.5	0	0
70	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0	0
75	1.0	0.5	0.5	0.5	0.5	0.5	0	0	0
80	0.5	0.5	0.5	0.5	0.5	0	0	0	0
85	0.5	0.5	0.5	0	0	0	0	0	0
90	0.5	0	0	0	0	0	0	0	0

Hardness value （HR）	Diameter of cylindrical specimen（mm）						
	6	10	13	16	19	22	25
	The correction of the rod B, F, and G（HR）						
20				4.5	4.0	3.5	3.0
30			5.0	4.5	3.5	3.0	2.5
40			4.5	4.0	3.0	2.5	2.5
50			4.0	3.5	3.0	2.5	2.0
60		5.0	3.5	3.0	2.5	2.0	2.0
70		4.0	3.0	2.5	2.0	2.0	1.5
80	5.0	3.5	2.5	2.0	1.5	1.5	1.5
90	4.0	3.0	2.0	1.5	1.5	1.5	1.0
100	3.5	2.5	1.5	1.5	1.0	1.0	0.5

Chart 4

2.The operating sequence of the hardness tester

2.1.Test HRC standard hardness block, select test force 1471N (150kg) and diamond indenter according to Chart 1.Turn the variable load handwheel clockwise to determine the total test force.

5. Proper use of Hardness Tester

2.2.Push the indenter (5) toward the main shaft hole, close to the bearing surface, face the notch of the indenter handle to the screw, tighten the indenter retaining screw (4) slightly, and place the HRC hardness block on the test bench(6).

2.3.Press,move the cursor to"set",pres OK.Displays the setup project table,Select "measuring staff" and press OK,The home screen displays 21 hardness test scales,select HRC,press OK,the home screen returns to the test state.

2.4.According to the operation method of 2.3, then select the conversion scale and hold-charge time of test hardness.

2.5.The rotary wheel (8)rotates clockwise and the lifting screw(7) rises. The test piece should be in contact with the indenter slowly and without impact until the hardness tester shows between 580 and 590. At this time, the test bench(6) stops rising and the hardness tester automatically adds test force. (When the test table rises too fast and the displayed value exceeds 600, the buzzer sounds long, indicating that the operation is wrong. The test table should be lowered, the position of the test piece should be changed and tested.

2.6.The test force is automatically added, and the holding time is 5 seconds. At this time, the seconds count down, from 5 to 0. When the motor rotates, the test force is automatically removed, the buzzer sounds, and the hardness test value of the display is read.

Note.When loading and unloading the test force, it is strictly forbidden to turn the variable load handwheel (9). If the force is rotated, the internal gear will be dislocated and the test force will be disordered.

2.7.Rotate the rotary wheel (8) in the opposite direction, lower the test bench (6), change the test point of the test piece, and repeat the above operation.

2.8.The test point on each test piece is not less than five points (the first point is not counted). For high-volume parts inspection, the number of measuring points can be appropriately reduced.

2.9.Move the cursor to the "Print" key and press the OK key to print the output. Complete operation.

6. Maintenance and Precautions

1.The test personnel should follow the operating rules, and can often use standard blocks to calibrate the instrument before and after the test. Infrequently used after the tester is turned on, the hardness test is performed several times on the standard block. After the test is stable, the test piece is tested.

2.During the hardness test, it is strictly forbidden to turn the variable load handwheel when applying test force, maintaining test force, and removing test force.

3.The use of the hardness block can only be performed on the working surface, and the distance between the two adjacent indentations and the center of the indentation is not less than 3mm, its service life is two years.

4.When the hardness tester is transported, the extension rod should be fixed, and the weight and hanger should be removed. Before removing weights and booms, unplug the power plug first.

5.The hardness tester should be kept clean. Cover the dust cover after the test. After using the hardness block and ball indenter, apply anti-rust oil.

6.The hardness tester should perform periodic inspections at least once a year to ensure the accuracy of the hardness tester.

7.Common Troubleshooting of Hardness Tester

When the hardness tester fails, it should be repaired by contacting the relevant unit. Common common failures can be resolved by themselves.(Chart 5)

6. Maintenance and Precautions

Phenomenon	Possible Causes	Method of exclusion
The screen doesn't light up when you turn it on	1 No power 2 Fuse burn out	1 Check whether the power cord is on 2 Take out the fuse in the accessory box and replace it
Keys do not work during startup	The instrument is in an inactive state	After turning on, wait for a while, the instrument will automatically resume working status
Lifting screw stuck	The fit clearance between the lifting screws is very small, and small threads or dirt may cause jams	Remove the lifting screw protection cover, wipe the thread with a clean cloth, and then hold the rotary wheel up and down to lift the lifting screw (disable the sandpaper friction screw).
Large deviation of hardness indication	1 Indenter is damaged. 2 The weights are installed in the reverse order. 3 The instrument is not placed horizontally, and the weight rubs against the inner wall of the body. 4 Incorrect selection of total test force or indenter	1 Replace the diamond indenter or ball indenter. 2 Install the weight set according to Figure 3. 3 Calibrate the hardness tester with a spirit level in accordance with the requirements of Article 2.4 of Chapter III. 4 Select test force and indenter according to Chart 1

7. Packing List

Sr.	Name（Specification）	Quantity
1	Diamond Rockwell Indenter	1
2	φ1.5875mm Ball Indenter	1
3	φ1.5875mm Ball	5
4	Big flat test bench, Middle flat test bench, "V" test bench	Total 3
	Standard Rockwell Hardness Block	
5	HRA、HRB、HRC High, medium and low	Total 5
6	Fuse 2A	1
7	Power line	1
8	Farmar A、B、C	Total 3
9	Dust proof plastic cover	1
10	Operation instruction	1
11	Packing list	
12	Certificate	1

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