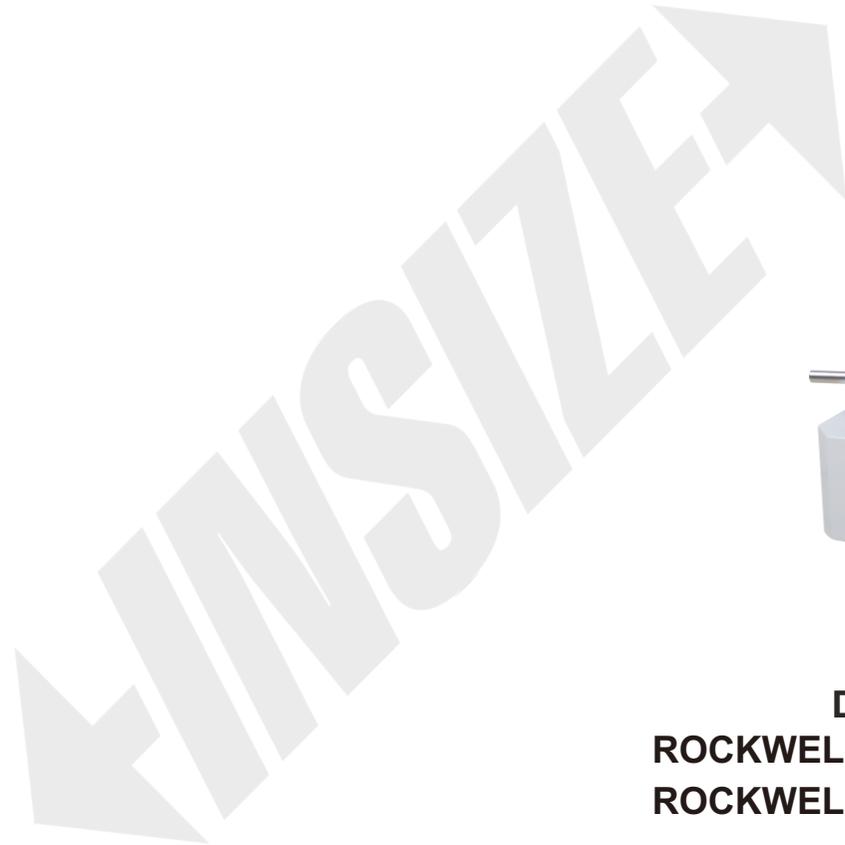




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**ISHR-T400/500/600
DOLPHIN-NOSE MODEL
ROCKWELL/SUPERFICIAL ROCKWELL/
ROCKWELL AND SUPERFICIAL ROCKWELL
OPERATION MANUAL**



Attention

1. The operator should observe the operation regulations and calibrate the instrument with the standard block before and after the test. If the tester is rarely used, the several tests should be carried out to make the tester stable and then carry out the necessary tests.
2. During the hardness test, when the loading and unloading of the test force or the keep of the dwell time is being carried out, it is prohibited to turning the load changing hand wheel.
3. The hardness block should be used only on the working plane with the distance of the two neighboring indentations and of the center of the indentations to their edges are not inferior 3mm. The life time of the blocks is 2 years.
4. Keep the tester clean and cover the tester after the use, lubricate the hardness blocks and ball indenters with the grease.
5. Carry out periodic control of the tester, at least once a year in order to assure the correct operation of the tester.
6. When transporting the instrument, it should be carried at the bottom and not allowed to cross. Unplug the power cord before handling.
7. Common failures and solutions (table below):

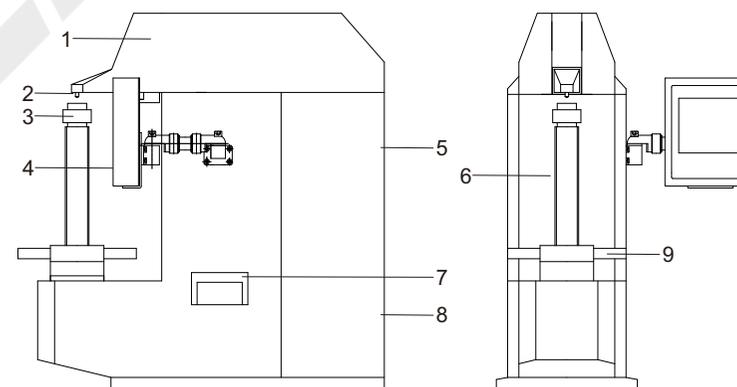
Phenomenon	Possible cause	Troubleshooting
Boot, screen do not react	1 Power do not supply	1 Check power supply
	2 Blown fuse	2 Replace fuse (the spare)
Boot, Key failure	The instrument is in a state of not working	Boot, and wait a moment
Lifting screw stuck	The gap between the lifting screw is small, fine thread or dirt may cause stuck	Take off the protective cover of the lifting screw, with a clean cloth to wipe thread, hold the rotary wheel with both hands, lift up and down the screw (Disable sandpaper friction screw)
The deviation of hardness is large	1 Indenter damage 2 Place the instrument is not level 3 Total test force or indenter selection error 4 Protective cover is higher than the screw plane	1 Replace the diamond indenter or ball indenter 2 Horizontal calibration hardness tester 3 Selection of test force and indenter follow table.1 4 Retreat the protective cover

Introduction

1 Main description

ISHR-T400/500/600 dolphin-nose model Rockwell hardness tester is a high-tech product with novel appearance and stable performance. It is the industry's leading Rockwell hardness tester with real-time display temperature of test environment. Its touch screen is simple, intuitive and convenient to perform Rockwell scale hardness test. The product is controlled by a microcomputer and equipped with a high-speed thermal printer to quickly print out test data. This model meets the requirements of Rockwell's national standard GB/T 230 and international standard ISO 6508. It can be widely used in enterprise workshops and laboratories. It is ideal for your Rockwell hardness test.

2 structure



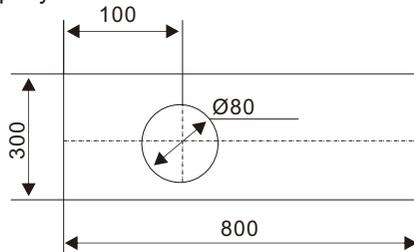
- 1-upper cover
- 2-indenter
- 3-testing table
- 4-touch screen
- 5-back cover
- 6- lift Screw (protective sleeve)
- 7-printer
- 8-power switch
- 9-rotate wheel

Operation

1 Installation of the hardness tester

1. The working condition of the tester
 - 1.1 Under the ambient temperature, i.e. between 10~30°C;
 - 1.2 The relative humidity in the test room shall not be over 65%;
 - 1.3 In an environment free from vibration and without corrosive in surroundings.
2. The unpacking of the tester
 - 2.1 Remove the outerbox, left and move the box and open the top cover and remove the strap that secures the lever.
 - 2.2 Lift the bottom plate; unscrew the two M10 bolts under the bottom plate with a spanner, to separate the hardness tester from the bottom plate, take out the hardness tester (be careful).
3. The install of the tester

After unpacking, the tester shall be placed on a stable bench and adjust to horizontal position. A hole shall be drilled at an appropriate location on the bench to enable the up and down moving shaft to operate properly.

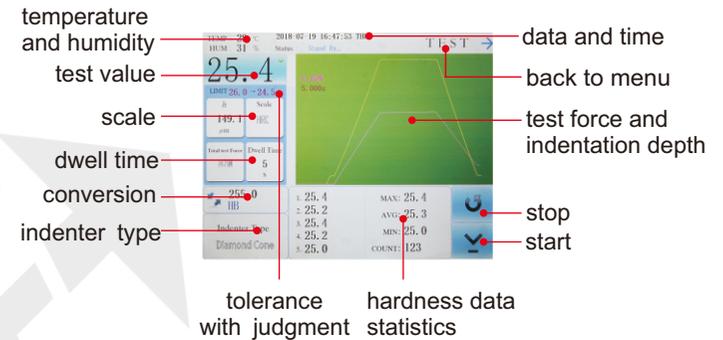


2 Operator panel and menu description

1. Connect the power cord and turn on the power switch, then the screen displays the product model number, click anywhere on the screen to enter the setup main interface.

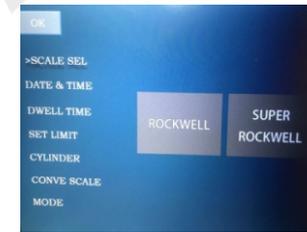


2. Click "Test" to enter the test interface as follows:



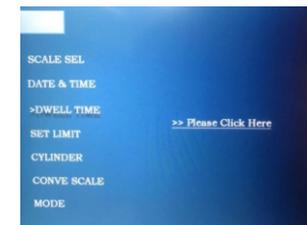
Quick operation: Click the target position of the test interface to directly enter the corresponding parameter setting interface.

3 Click "Options" to enter the settings interface, click the corresponding position in the figure below to enter the corresponding settings page



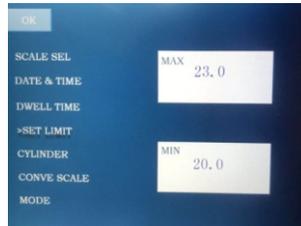
Select the test scale:

Click "SCALE SEL" to enter the hardness scale selection interface, as shown above, clicking the corresponding scale position means that the scale is selected.



Set the dwell time:

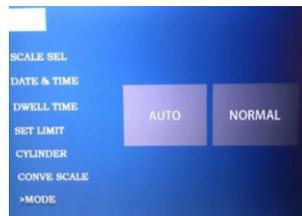
Click "DWELL TIME" to set the dwell time, enter the corresponding number in the pop-up numeric keypad, as shown above, then click the OK button, if want to cancel, click the BACK button in the keyboard .



Set tolerance:
Click " SET LIMIT" and set the upper and lower tolerances in the right frame. MAX is the upper difference and MIN is the lower tolerance.



Conversion scale:
Click on "CONVE SCALE" and select the scale to be converted in the right frame.



Select the measurement mode: you need to click twice to display a green tick to indicate that the mode is selected.
Click "MODE", select the measurement mode in the right frame, AUTO is the automatic mode, this function does not need to press the start button every time after the test is turned on; NORMAL is the normal mode, the mode is the single point test mode, that is, press once Start button to perform a test.

Screen calibration:
Quickly tap the touch screen blank area more than 20 times in 4 seconds. The buzzer sounds for 1 second, and stop clicking. Enter the calibration mode, follow the prompts of the cross line, click the specified position of the touch screen to calibrate the touch screen, and the calibration is over.

1. Preparatory work

1.1 The surface of the specimen must be clean. There can't be dirty, oxide skin, pits or significant processing trace, must ensure that the test force is applied perpendicular to the specimen.

1.2 The minimum thickness of the specimen shall be more than 10 times the depth of the indentation. There can't be visual deformation traces on the back of specimen after testing.

1.3 Test pieces shall be stably placed on the test table, during testing can not move the specimen, and to ensure that the test force is applied vertically on the specimen.

1.4 According to the specimen shape and size to select the appropriate test Table. irregularly shape Specimens can manufacture special fixture according to their own specific shapes to make hardness test shows correct value.

2. Operation sequence of hardness tester

according to the hardness of materials(Table 1) select test scale (follow tips choose indenter).

Table 1

Scale	Type of indenter	Preliminary test force	Test force	Application range
A	diamond indenter	98.07(N)	588.4(N)	Cemented carbide, nitride, surface hardened steel, etc.
D			980.7(N)	Thin steel plate, surface hardened steel, etc.
C			1471(N)	Hardened steel, chilled cast iron, etc.
F	ball indenter Ø1.5875 (1/16 inch)		588.4(N)	Cast iron, aluminum, bearing alloy, magnesium alloy, etc.
B			980.7(N)	Mild steel, copper alloy, annealed steel, etc.
G	ball indenter Ø3.175 (1/8 inch)		1471(N)	Phosphor bronze, malleable cast iron, etc.
H			588.4(N)	Aluminum, zinc, lead, etc.
E	ball indenter Ø6.35 (1/4 inch)		980.7(N)	Bearing alloy, tin, hard plastic, etc.
K			1471(N)	
L	ball indenter Ø6.35 (1/4 inch)		588.1(N)	Hard plastic, hard rubber, aluminum, tin, copper, mild steel, synthetic resin and friction materials.
M		980.7(N)		
R		588.4(N)		

Scale	Type of indenter	Preliminary test force	Test force	Application range
15N	diamond indenter	29.42(N)	147.1(N)	Surface carburized layer, surface nitrided layer, surface hardened steel sheet, etc.
30N			294.2(N)	
45N			441.3(N)	
15T	ball indenter Ø1.5875 (1/16 inch)		147.1(N)	Thin specimens of cast iron, magnesium alloy, mild steel, copper alloy, annealed steel, phosphor bronze, beryllium bronze, etc.
30T			294.2(N)	
45T			441.3(N)	
15W	ball indenter Ø3.175 (1/8 inch)		147.1(N)	Thin sample of aluminum, zinc, lead, tin, hard plastic, etc.
30W			294.2(N)	
45W			441.3(N)	
15X	ball indenter Ø6.35 (1/4 inch)		147.1(N)	Thin sample of hard rubber, copper, synthetic resin and friction material.
30X			294.2(N)	
45X			441.3(N)	
15Y	ball indenter Ø12.7 (1/2 inch)	147.1(N)		
30Y		294.2(N)		
45Y		441.3(N)		

For example : test the hardness of HRC:

- 1) The middle finger of the hand pushes the diamond head, pushes the diamond indenter toward the spindle hole, closes to the top surface, tightens the head tightening screw slightly, and then places the tested piece on the test bench.
- 2) Click on the hardness scale and select HRC; if you want hardness conversion, click on the conversion scale.
- 3) Click on the dwell time and select 5 seconds.
- 4) Click the Start Test button.

5) Turn the rotating wheel clockwise to raise the lifting screw. The test piece should be slowly raised until the display shows that the load reaches 10N. The instrument enters the automatic test state. (Note: Do not use excessive force to operate, if "overload" is displayed, you need to restart the test.) The hardness tester will sound a "di" and start loading. The loading, keeping, and unloading status will be displayed on the screen, and the hardness value will be displayed.

6) According to qualification requirements, the first measurement should not be documented. Document hardness value starting from second point and 3-5 points are necessary and use the average.

3. Regulation of Hardness Displaying Value

3.1 The precision of the hardness displaying value of the hardness tester is just calibrated before the instrument is turned out of the factory. If an error is caused due to the transportation or according to the various requirements of the client,

The tester can make proper calibration. When the hardness value is displayed at the end of a test, the hardness value calibration selection page will appear on the screen by clicking the hardness value number, according to the current calibration scale to do the calibration.

Hardness value calibration password: 265664



3.2 Click on the "Calibration" frame to pop up the numeric keypad and enter the hardness of the calibrated hardness block.

3.3 In the "Calibration model" item, select the "Base" mode. Note: The "Ordinary" mode is the factory debug mode. Do not select this mode!

3.4 In the "Range of hardness" item, select the current calibration section, and "L", "M", and "H" in turn indicate the low, medium, and high hardness section. Note: The hardness of all three sections needs to be calibrated!

3.5 First enter the actual hardness value of the calibration block and place the block on the measuring platform. Click "Dwell time" to set the dwell time, and finally click the icon in the lower right corner to execute the test. Conduct measurement operation (at least 3 times). When all hardness blocks in all hardness ranges are measured, click the back button in the upper left corner.

Note: After the hardness calibration test is started, the hardness of the current point will be displayed at the "Current Hardness". This hardness is the original hardness and has a certain deviation from the hardness block, which is normal. It is recommended that each hardness block be subjected to three or more hardness calibration tests in succession. When the repeatability of the original hardness is within 0.5 HR, it is valid for calibration.

