

DT-330 Ultrasonic Thickness Gauge

Instructions



Haian Discory Detecting Instrument CO.,Ltd

Preface

Thank you for choosing the DT-330 Ultrasonic Thickness Gauge. It is our great pleasure to have you as a user of the Haian Discory Detecting Instrument CO. In order for you to become proficient in the use of this instrument, we have included an instruction manual with the instrument.

This manual is an important part of the instrument and provides operating and safety guidelines for the proper use and maintenance of the instrument. Before using the instrument for the first time, be sure to read this manual carefully to understand the instrument's performance and fully utilize its functions. After reading this manual, please keep it in a safe place for future reference.

The contents and specifications of this manual are subject to change when necessary. Haian Discory Detecting Instrument CO., Ltd reserves the right to improve and innovate the instrument at any time without prior notice.

- 1、Service Call: 400-012-6866.
- 2、Email: postmaster@dscr.com.cn.
- 3、Website: <http://www.dscr.com.cn>.

Thanks for your cooperation!

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overview

Scope of application

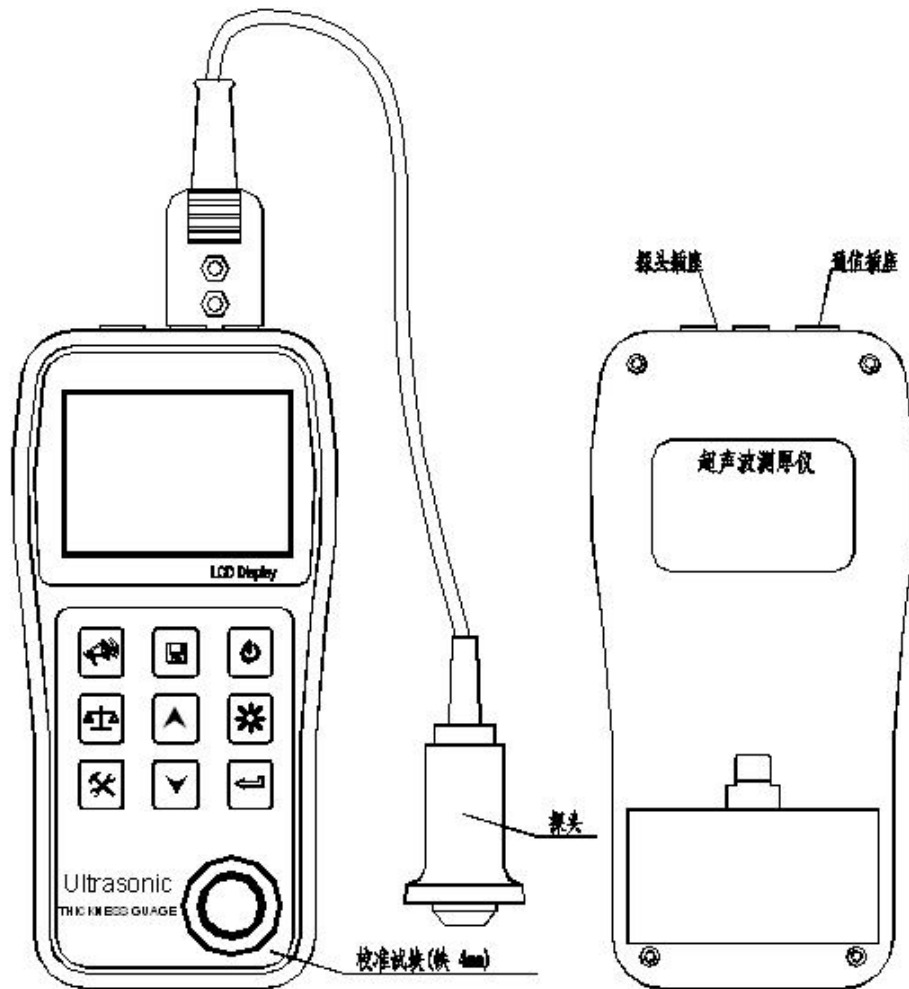
DT330 Ultrasonic Thickness Gauge, It can measure the thickness of metal materials, pipes, pressure vessels, plates (steel plates, aluminum plates), plastics, iron pipes, PVC pipes, glass, and other special materials; it can also measure materials with coatings such as paint layers on the surface of the workpiece; it is widely used in the production industry, metal processing industry, chemical industry, commercial inspection industry, and other testing fields.

Basic principle










An Ultrasonic Thickness Gauge is a nondestructive testing (NDT) method that evaluates the thickness of a component by measuring the time it takes for sound to travel from the transducer through the material to the back end of a component, and then measures the time of reflection back to the transducer. The gauge then determines the thickness based on the velocity of sound through the material being tested. Ultrasonic thickness gauges are suitable for corrosion monitoring, wall thickness measurement, casting/molding thickness testing.

Appearance

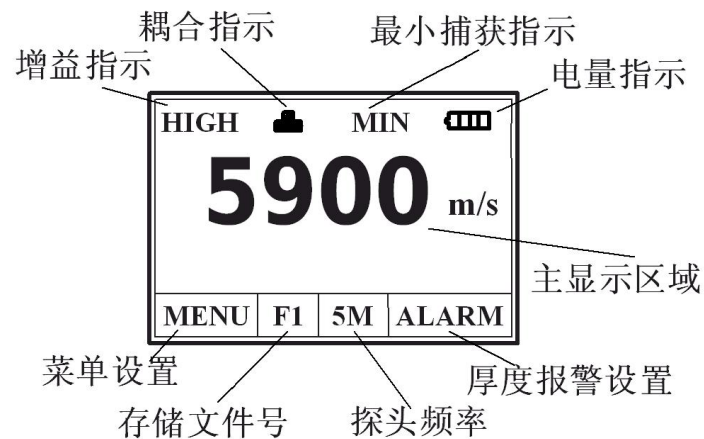
1.1.1 Composition and function (see figure below).



1.1.2 Keyboard identification

-  on-off
-  LED Backlight
-  Sound choices  Save records
-  Calibration (4mm Steel)
-  Function key
 -  Adjust the sound speed and thickness; Menu selection
 -  Adjust the sound speed and thickness; Menu selection
 -  Confirm.

1.3.3 Display



Performance

Technical Parameters

- **Display:** 128×64 LCD With LED backlight.
- **Measuring range:** 0. 75mm~300.0mm (0.03inch~15.7 inch)
- **Sound speed range:** 1000m/s~9999m/s (0.039~0.394in/μs)
- **Resolution ratio:** 0.01mm or 0.1mm (< 100.0mm)
0.1mm (> 99.99mm)
- **Accuracy:**

	Resolution ratio 0.01mm	Resolution ratio 0.1mm	remark
<10.0mm	± 0.05mm	± 0.1mm	H the actual value of the standard thickness block
10mm-100mm	± (0.5%H+0.05) mm		
>100mm	± (1%H+0.1) mm		
High temperature	± (1%H+0.1) mm		
Pipe	± (1%H+0.1) mm		


- **Unit of measurement:** metric/imperial
- **Power supply:** Two No. 5 dry batteries, normal working time 100h (no backlight).
- **Communication Port:** RS232
- **Size:** 150mm×74mm×32mm
- **Weight:** 238 g
- **Test frequency:** 20times/s
- **Display period:** 2times/s
- **Data storage:** 500group;

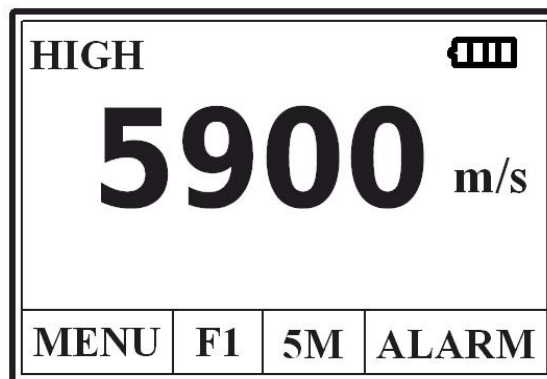
Main Functions

- 1) Automatic correction (4mm)
- 2) Frequency selectable (2M ; 5M; 7M)
- 3) Two-point calibration function
- 4) Coupling status indication
- 5) Battery indicator
- 6) Automatic shut-off
- 7) Background data processing
- 8) Printing supported




Measurement & Operation

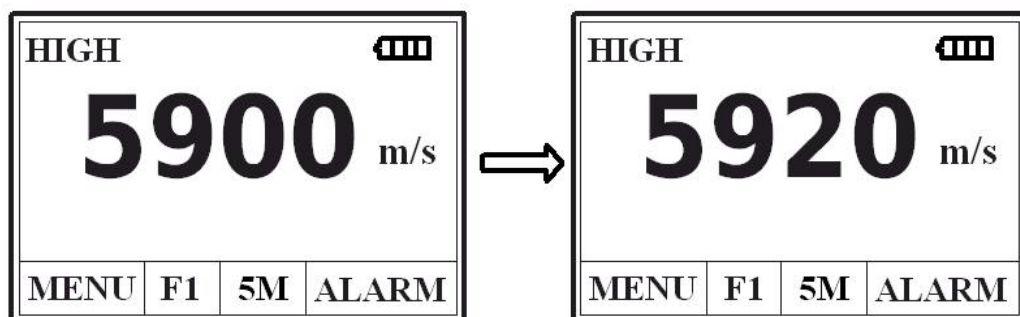
Measurement preparation

- 3.1.1 Insert the probe plug into the host probe socket
- 3.1.2 Press  the key to power on
- 3.1.3 After the software information is displayed, the speed of sound used during the last measurement is displayed





Adjust the sound speed

Press  key to enter sound speed screen. There are 5 pre stored values available, by Press  key. Also can directly adjust the value by using  key.



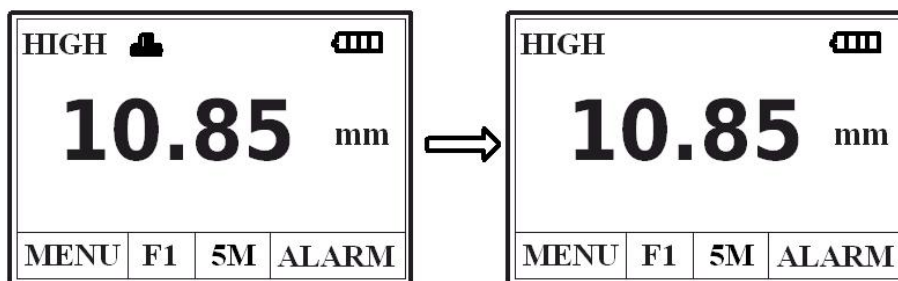
Frequency setting

Press  key to select frequency setting, Press  key to adjust the value range.






Measure thickness

Set up sound speed first, Applying the couplant, and test with probe.

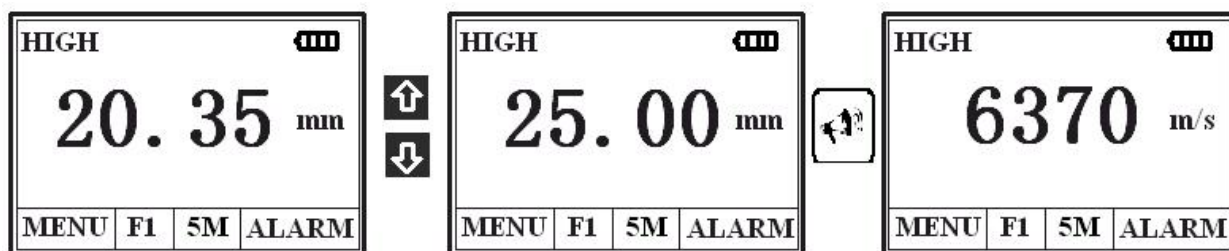


Note When the probe is coupled to the material being measured, the coupling flag is displayed. If the coupling flag flashes or does not appear, the coupling is not good

Sound velocity measurement

If you want to measure the sound velocity of a material, you can measure the sound velocity using a test block of known thickness. Measure the test block with a vernier caliper or micrometer first to accurately read the thickness value. Couple the transducer with the known thickness test block until a thickness value is displayed, after removing the transducer, adjust the display value to the actual thickness value with the OR key, and  then press the  key to display the measured sound velocity, and the sound velocity is  stored in the current sound velocity storage unit, the sound velocity measurement must select a test block of sufficient thickness, the recommended minimum wall thickness is 20.0mm, Minimum capture and two-point calibration should be turned off when measuring sound velocity.

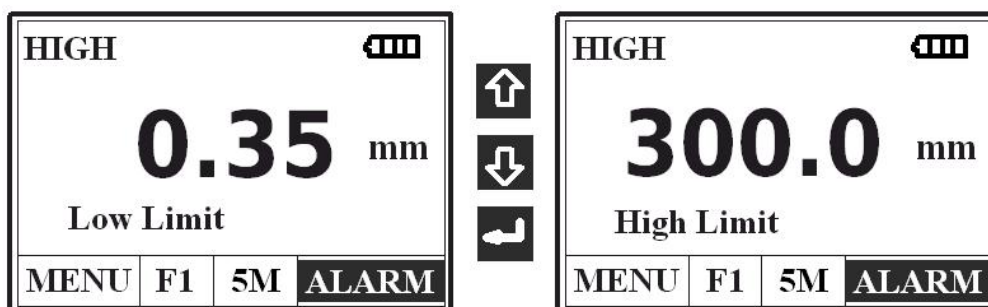
For example, if you are measuring the sound velocity of a material with a thickness of 25.0 mm, the operation is as follows



Set the measurement alarm limit

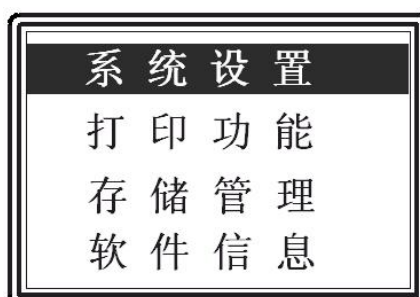
When the measured value is lower than the lower alarm limit or higher than the upper alarm limit, the buzzer sounds, and the operation is as follows

- 1) Press the key to move the cursor to **ALARM**
- 2) Press the key to display the last set high or low alarm setting value, with or set a new lower or upper limit
- 3) To exit the alarm limit setting, press the key, key, or start a measurement.



Menu actions

The main setup functions of the instrument are operated via menus. Press the key to move the cursor to **MENU** Press the key to display the main menu.



3.7.1 System Settings

单位	公制
增益	高
显示精度	高
最小捕获	关

两点校准	关
自动关机	开
波特率	9600
对比度设置	

1) **Unit of measurement:** Metric/Imperial

2) **Received Gain:** Low/High

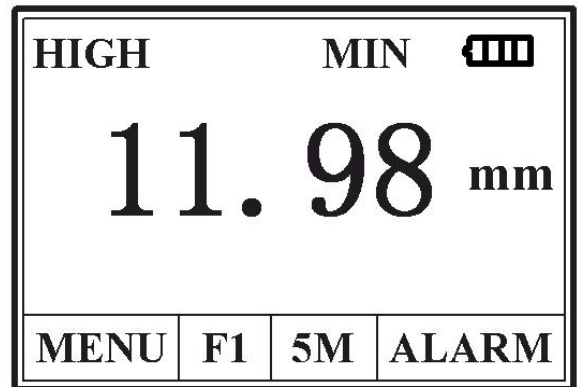
The gain low grade is mainly used to measure coarse crystal materials with large scattering and low sound absorption, such as cast aluminum, cast copper and other metal castings. .

3) **Display accuracy:** 0.1mm(low) 0.01mm(high).

4) Minimum capture measurement method

Off/On

1. Minimum measurement capture captures the smallest numeric value in a set of measurements. When the probe is coupled to the workpiece, the actual measured value is displayed, when the probe is raised, the minimum value in the measurement just now is displayed, and the minimum value flag MIN flashes for a few seconds, if the measurement continues during the MIN flash, the previous measurement will continue to participate in the minimum value capture, and the minimum measurement value capture will be performed again after the MIN stops flashing .

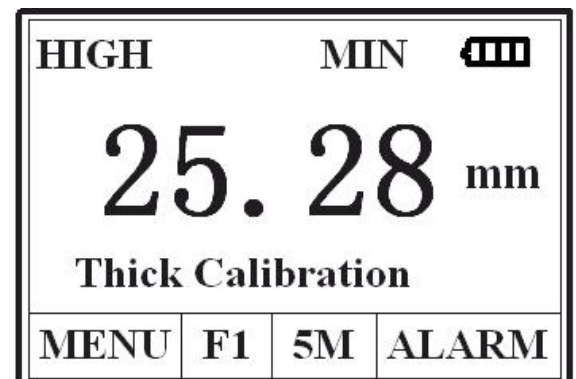
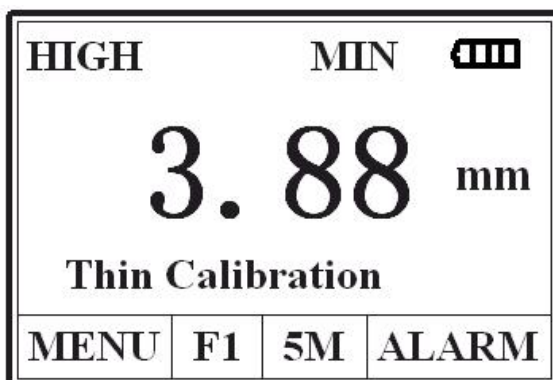




2. When the minimum measured value capture function is turned on, there is a MIN indication on the display after exiting the setup.
Press the key to go back to the upper menu, press the key or take a measurement, and exit the setting state.

5) Two-point calibration:



off/on


1. Select two standard blocks with the same material, sound velocity and curvature as the measured object, one of which has a thickness equal to or slightly higher than the upper limit of the measurement range, and the other test block whose thickness is as close as possible to the lower limit of the measurement range, and two-point calibration can improve the measurement accuracy.
2. Minimum snapping should be turned off before performing two-point calibration.
3. Previous calibration data must be deleted
The operation is as follows: select the Delete function in the function menu Storage and turn on the two-point calibration function.
4. Turn on the two-point calibration function.
5. Press the key to return to the main display interface.
6. Press Enter the two-point calibration method while measuring thickness
The screen prompts to the thin slice.



7. Measure the sheets. Use  or  adjust the measured value to the standard value.

Then  press the key on-screen to calibrate the thick slice Thick Calibration

8. Measure thick sheets. Use  or  adjust the measured value to the standard value.


9. Press the  key The two-point calibration process is complete, and the measurement status is ready.

! Note: When measuring pipes, due to the matching and coupling of acoustic impedance will affect the measurement error, in order to accurately measure the thickness of the pipe, it is best to choose two standard blocks with the same material, sound velocity and curvature as the measured object for two-point calibration!

6) Automatic shutdown: Automatic shutdown for about 5 minutes without operation

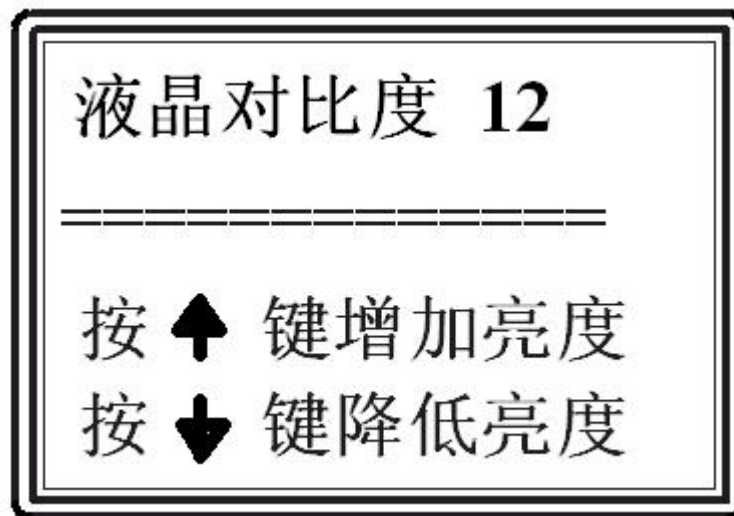
7) Communication rate: 1200; 2400; 4800; 9600 (default) No communication port model retained

8) LCD display contrast

1. Press  the key to select LCD contrast:

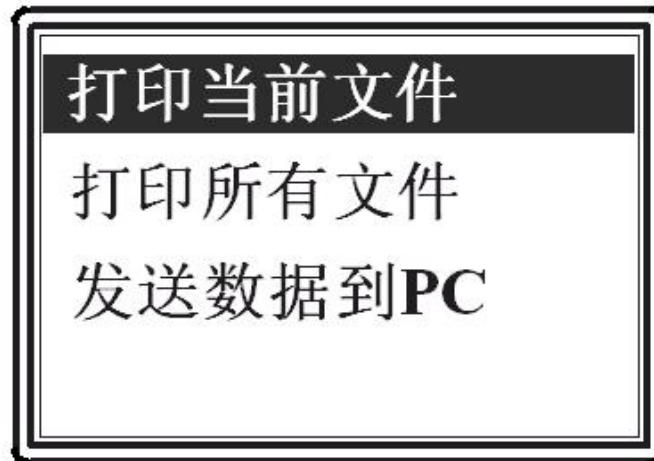
2.  Adjust  the contrast with the and keys

3. Press the  key to exit the setup



3.7.2 Print function (model without communication port retained).


Connect the instrument to the microprinter with a communication cable, and print the measurement results via menu selection. The procedure is as follows

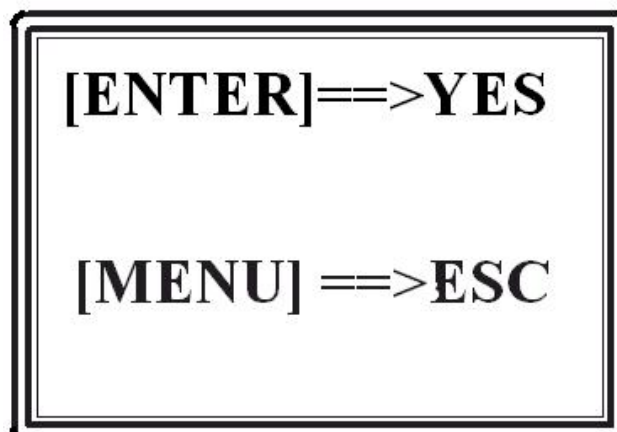




There is a beep prompt when the print is complete, and the status of the return menu is displayed

3.7.3 Storage Management




Press the key to select the desired operation,  and the screen will prompt whether to confirm the deletion operation, as shown below




Press the  key to confirm the deletion of the selected data;
Press the  key to cancel the current deletion.

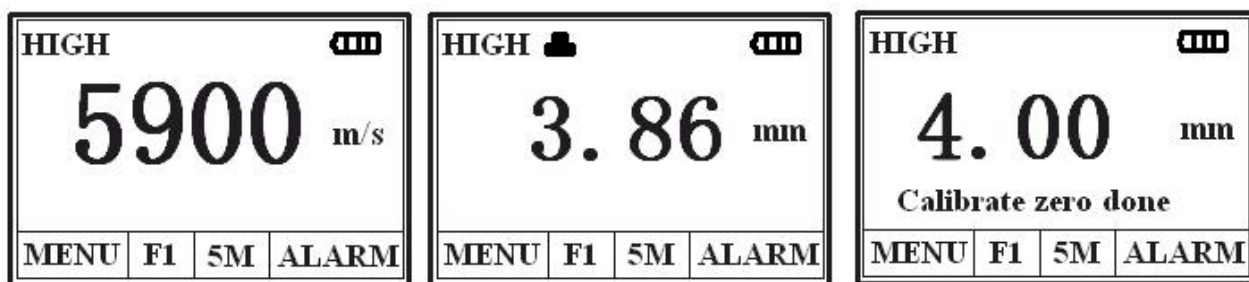
Zero calibration operation

Adjust the sound velocity to 5900m/s (see 3.2), set the gain to the gain to be used for measurement (see 3.7), then couple the probe to the 4mm standard test block

on the housing and display the coupling flag, press  the key to zero off.

The instrument buzzer sounds, and the indicator of calibration completion is displayed on the screen: **calibrate zero done** means that the calibration is complete, and the calibration data of this probe is stored in the instrument, if you want to delete the calibration data, please press Delete calibration data (see 3.7.3),


if the instrument is not  coupled to the standard block before pressing the key or does not show the calibration completion indication is that the calibration is not successful, the instrument will save the original calibration value, The screen display process is shown in the following figure:




Note: After each probe replacement, after the probe temperature, ambient temperature and other working environment changes, or after working for a period of time and finding that the measured value is wrong, you should check whether the measured value of the standard test block is accurate, and if the difference is large, you should perform the zero calibration operation.

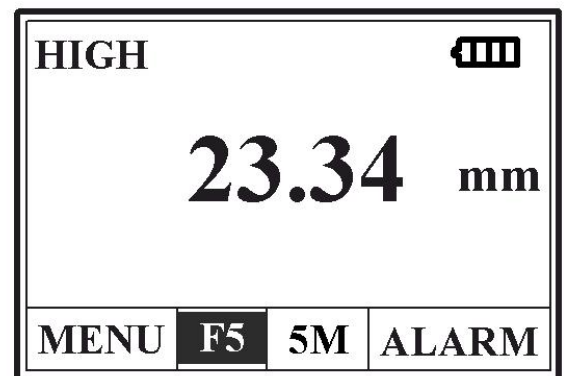
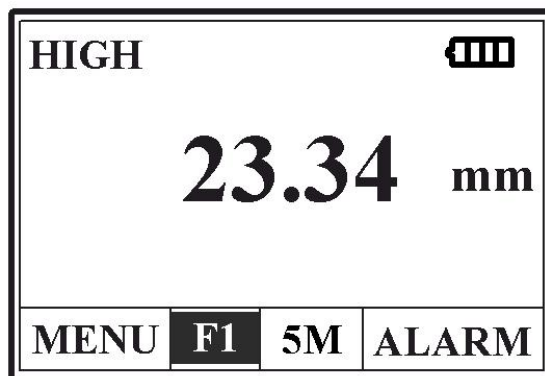
After calibration, it is shown that the thickness value may deviate from 4.00 by $0.02 \pm$, and no further calibration is required as long as the calibration completion indication is displayed.



Data storage operations

The instrument has a thickness storage function, which divides the storage unit into 5 files, each of which can store 100 measured values. Set the file number before storing the data. If you select the current file number, you can directly press the key  to save the measured value after measurement.


Save file selection

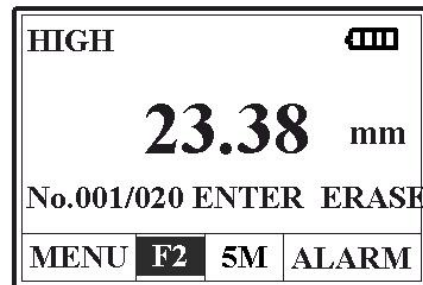
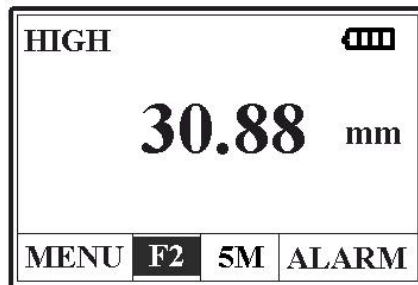
1) Press the  key to move the cursor to the position below







2) Press the key, the file number press  F1-F5 to cycle the display, press the key or make a measurement to exit the setting, after the file number is set, you can press the key to save the measured value to the file after each measurement, and display "Memory" once after the storage is completed  Indicates that the save has been successful.

Historical data browsing and deletion

- 1) Press the  key to move the cursor to the position below



- 2) Press the  key to browse for data in the current file.
3) Press  the key to delete the currently displayed data.
4) Press the  key or key  to browse for additional data in the current file.

Measurement technology

Clean the surface

Before measuring, all dust, dirt and rust on the surface of the measured object should be removed, and paint and other covers should be removed.

Increase roughness requirements

Excessively rough surfaces can cause measurement errors or even no readings from the instrument. Before measurement, the surface of the tested material should be smooth as much as possible, and it can be smoothed by grinding, throwing, filing and other methods. High-viscosity couplants can also be used.

Rough machined surface

The regular fine groove caused by the rough machined surface (such as a lathe or planer) will also cause measurement errors, the method is the same as 6.2, and the angle between the probe crosstalk compartment plate (through the metal thin layer in the center of the bottom surface of the probe) and the fine groove of the measured material is adjusted to make the compartment plate and the fine groove perpendicular or parallel to each other, and the minimum value in the reading is used as the measurement thickness to achieve better results.

Measure cylindrical surfaces

When measuring cylindrical materials such as tubes, drums, etc., it is important to select the angle between the probe crosstalk compartment plate and the axis of the material to be measured. Simply put, couple the probe with the test

material, the probe crosstalk compartment plate is parallel or perpendicular to the test material axis, slowly shake the probe along the direction perpendicular to the test material axis, and the on-screen reading will change regularly, select the minimum value in the reading as the exact thickness of the material.

The criteria for selecting the angle direction of the probe crosstalk compartment plate and the axis of the measured material depend on the curvature of the material, the pipe with a larger diameter, the selection of the probe crosstalk compartment plate perpendicular to the axis of the tube, and the pipe with a smaller diameter, then select two measurement methods parallel and perpendicular to the axis of the tube, and take the smallest value in the reading as the measurement thickness.

Composite form factor

When measuring a composite shape of a material (such as a tube elbow), the method introduced in 6.4 can be used, except that a secondary measurement is performed, respectively, reading two values perpendicular and parallel to the axis of the probe crosstalk compartment plate, the smaller of which is the thickness of the material at the measurement point.

Non-parallel surfaces

In order to obtain a satisfactory ultrasonic response, the other surface of the test material must be parallel or coaxial to the test surface, otherwise measurement errors or no readings will be displayed at all.

Temperature influence of materials

The thickness of the material and the ultrasonic propagation speed are affected by the temperature, if the measurement accuracy is high, the test block comparison method can be used, that is, the test block of the same material is used to measure under the same temperature conditions, and the temperature compensation coefficient is obtained, and the measured value of the measured workpiece is corrected with this coefficient.

Large attenuation material

For some materials such as fibers, porous, coarse particles, they will cause a lot of scattering and energy attenuation of ultrasonic waves, so that abnormal readings or even no readings (usually abnormal readings are less than the actual thickness), in which case the material is not suitable for testing with this thickness gauge.

Take the exam block

Different materials are measured accurately under different conditions, and the closer the material of the calibrated block is to the material to be measured, the more accurate the measurement will be. The ideal reference block will be a group of different thicknesses of the test material, and the test block can provide

instrument compensation for correction factors (such as the microstructure of the material, heat treatment conditions, particle orientation, surface roughness, etc.). In order to meet the requirements of maximum accuracy measurement, a set of reference blocks will be important.

In most cases, satisfactory measurement accuracy can be obtained using only a reference block of the same material and similar thickness as the material to be tested. After measuring the uniform material with a micrometer, it can be used as a test block.

For thin materials, a test block can be used to determine the exact low limit when its thickness is close to the lower limit of the probe measurement. Do not measure materials below the lower limit thickness. If a thickness range can be estimated, the thickness of the test block should be selected at an upper limit.

When the material to be tested is thick, especially the alloy with a complex internal structure, one should be selected in a group of test blocks close to the material to be tested, so as to facilitate the calibration.

Most of the internal structure of forgings and castings has directionality, in different directions, the speed of sound will have a small change, in order to solve this problem, the test block should have the same internal structure as the measured material, and the direction of sound wave propagation in the test block should also be the same as the direction in the test material.

In certain cases, the sound velocity table of the known material can replace the reference block, but this is only an approximate replacement of some reference blocks, and in some cases, the value in the sound velocity table is different from the actual measurement, because the physical and chemical conditions of the material are different. This method is often used to measure mild steel, but only as a rough measurement.

Ultrasonic thickness gauges have the function of measuring the speed of sound, so the sound velocity can be measured first, and then the workpiece can be measured at this sound speed.

Several methods in measurement

Single measurement method: measurement at one point.

Double measurement method: Two measurements are taken with a probe at one point, in which the probe crosstalk compartment plates are perpendicular to each other. Select the minimum value in the reading as the exact thickness of the material.

Multi-point measurement method: multiple measurements are made within a certain measurement range, and the minimum value is the material thickness value.

Choice of probe

Model	characteristic description	Frequency (MHZ)	Minimum pipe diameter	Measuring range	Permissible contact temperature
2P012 (ZT-12) High penetration probe	Coarse crystals Cast iron can be measured	2	20mm	3.0mm~300.0mm (steel).	-10~60℃
5P010 (CT-10) Standard probes	general	5	Ø20×3mm	1.2mm~300.0mm (steel).	-10~60℃
5P010/90 Standard probes					
7P06 (XT-6) Small diameter probe	Thin pieces Small arc surface	7	Ø15×2mm	0.75mm~80.0mm (steel).	-10~60℃
ZW5P014 High temperature probes	High temperature resistance	5	30mm	3.0mm~200.0mm (steel).	350 ° C below
TSTU32 High penetration probe	High penetration	2	22mm	5.0mm~40.0mm (cast iron).	-10~60℃

Wear of the probe crosstalk compartment plate will affect the measurement, and the probe should be replaced when the following phenomena occur.

When measuring different thicknesses, the measured value always shows a certain value.

If the probe is plugged in and no measurement is taken, an echo indication or a measured value appears.

Casting measurement

Casting measurement has its own peculiarities. The grains of the casting material are relatively coarse, the structure is not dense enough, and it is often measured in the rough state, so that the measurement encounters greater difficulties.

First of all, the coarse grain and the non-dense structure cause a great attenuation of sound energy, which is caused by the scattering and absorption of sound energy by the material. The degree of attenuation is closely related to grain size and ultrasonic frequency, and the attenuation at the same frequency increases with the increase of grain diameter, but there is a highest point, beyond this, the

grain diameter increases again, and the attenuation basically tends to a fixed value. The attenuation for different frequencies increases with frequency.

Secondly, due to the coarse grain and the presence of coarse out-of-phase structure in casting, abnormal reflections, that is, grassy echoes or dendritic echoes, will be generated, resulting in incorrect readings in thickness measurement, resulting in false judgments.

In addition, with the coarsening of the grain, the elastic anisotropy in the direction of metal crystallization is more pronounced, so that the speed of sound in different directions is different, and the maximum difference can even reach 5.5%. Moreover, the compactness of the tissue at different positions in the workpiece is also inconsistent, which will also cause differences in sound velocity, which will produce inaccurate measurements, so special care should be taken for casting measurement. When measuring castings, attention should be paid to:

When measuring castings that are not machined on the surface, viscous oil, butter and water glass must be used as couplants.

It is best to calibrate the sound velocity of the material with a standard block that is the same material as the DUT and the same direction as the DUT.

Two-point calibration can be performed if necessary.

Temperature influence of materials

The thickness of the material and the ultrasonic propagation speed are affected by the temperature, if the measurement accuracy is high, the test block comparison method can be used, that is, the test block of the same material is used to measure under the same temperature conditions, and the temperature compensation coefficient is obtained, and the measured value of the measured workpiece is corrected with this coefficient. For steel, high temperatures will cause large errors, which can be used to compensate for corrections. Steel thicknesses with surface temperatures up to 300° C can be measured with high-temperature probes. Precautions when measuring high temperature steel:

The random high-temperature couplant is evenly applied to the surface of the high-temperature probe, and the amount of couplant should be moderate;

Handheld probe for point contact measurement. The contact time between the probe and the measured object is no more than 5 seconds. The probe should be cooled with water or naturally cooled after each measurement. Since the high-temperature measurement adopts the point-contact measurement method, the contact time between the probe and the measured object is short, so the measurement may sometimes fail, and it is necessary to measure repeatedly when measuring high-temperature materials.

For every 100 ° C increase in the general temperature of steel, the sound velocity of the material decreases by about 1%, so the measured value should be corrected.

Example: H0 is defined as the actual thickness value of the material and H1 is defined as the displayed value measured with a thickness gauge

Then: at 100° C, H0 H1×0.99

At 200° C, H0 H1×0.98

At 300° C, H0 H1×0.97

Two-point calibration can also be used during high-temperature measurements to eliminate measurement errors during high-temperature measurements.

Prevention methods for measurement errors

Ultra-thin material

With any ultrasonic thickness gauge, when the thickness of the material to be measured drops below the lower limit of the transducer's use, it will result in measurement errors, and if necessary, the minimum limit thickness can be measured using the test block comparison method.

When measuring ultra-thin materials, an error result called "double refraction" sometimes occurs, which shows that the reading is twice the actual thickness, and another error result called "pulse envelope, cyclic jump", which results in a measured value greater than the actual thickness, in order to prevent such errors, the measurement of critical thin materials should be repeated when the measurement is repeated.

Rust spots, corrosion pits, etc

Rust spots and pits on the other surface of the material to be tested will cause the reading to change irregularly, and in extreme cases there is even no reading, and small rust spots are sometimes difficult to find. When pits are found or suspected, this area must be measured very carefully, and the positioning of the probe crosstalk compartment plate at different angles can be selected for multiple tests.

Material identification error

When the instrument is calibrated with one material and then tested with another, erroneous results will occur, and care should be taken to select the correct sound velocity.

Wear of the probe

The surface of the probe is acrylic resin, long-term use will increase the roughness, resulting in a decrease in sensitivity, the user can determine the error caused by this cause, sandpaper or oil stone a small amount of sanding the probe surface to smooth and ensure parallelism. If it is still unstable, the probe needs to be replaced.

Laminated materials, composite materials

It is impossible to measure uncoupled laminated materials because ultrasonic waves cannot penetrate uncoupled spaces. And because ultrasonic waves cannot propagate at a uniform speed in composite materials, instruments that measure

thickness by ultrasonic reflection principle are not suitable for measuring laminated materials and composite materials.

The influence of oxide layer on the surface of the metal

Some metals can produce a denser oxide layer on their surface, such as aluminum, etc., which is tightly bound to the substrate without obvious interface.

However, the propagation speed of ultrasonic waves in these two substances is different, so it will cause errors, and the thickness of the oxide layer is different, the size of the error is also different, please pay attention to it when using, you can choose a micrometer or caliper measurement in the same batch of measured materials to make a sample, the instrument calibrate.

Unusual thickness readings

The operator should have the ability to distinguish abnormal readings, usually rust spots, corrosion pits, and internal defects of the tested material will cause abnormal readings. The solution can be found in Chapters 5 and 6.

Use and selection of couplant

Couplants are used as high-frequency ultrasonic energy transfer between the transducer and the material under test. If the type is selected or used improperly, it may cause errors or flashing coupling flags, and the value cannot be measured. The couplant should be used in appropriate amounts and sprayed evenly.

It is important to select the appropriate kind of couplant, and when used on smooth material surfaces, low viscosity couplants (e.g., randomly configured couplants, light engine oils, etc.) are suitable. When used on rough material surfaces, or vertical surfaces and top surfaces, couplants with higher viscosity (e.g. glycerin paste, butter, grease, etc.) can be used.

Couplants for various formulations are available everywhere.

Notes

Cleaning of test blocks

Since couplant is applied when testing the instrument with random test blocks, pay attention to rust prevention. Wipe the random test block clean after use. Do not get sweat when the temperature is high. Long-term non-use should be coated with a little grease on the surface of the random test block to prevent rust, when used again, the grease can be wiped off, and the normal work can be carried out.

Cleaning of the casing

Alcohol, diluent, etc. have a corrosive effect on the casing, especially the window, so when cleaning, gently wipe with a small amount of water.

Probe protection

The probe surface is acrylic and sensitive to re-scratching of rough surfaces, so it should be pressed lightly during use. When measuring rough surfaces, minimize probe scratching on the work surface.

When measuring at room temperature, the surface of the measured object should not exceed 60 ° C, otherwise the probe can no longer be used.

The adhesion of oil and dust will gradually age and break the probe wire, and the dirt on the cable should be removed after use.

Battery replacement

After the low voltage indicator appears, the battery should be replaced in time, as follows:

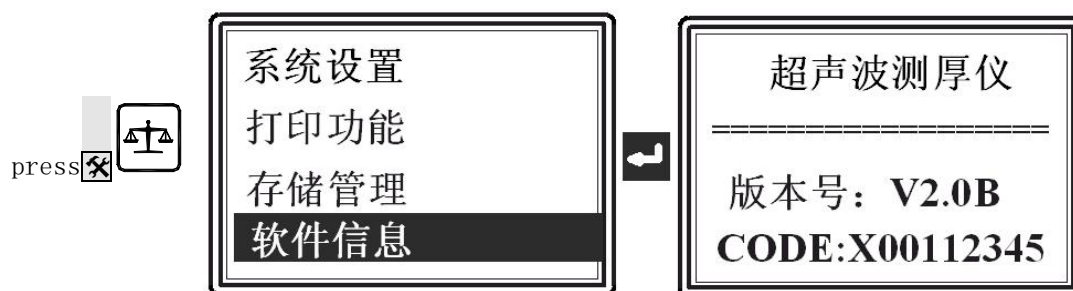
shutdown; Open the battery compartment cover and remove the battery; Put in a new battery. Pay attention to polarity.


When the instrument is not in use for a long time, the battery should be removed to avoid battery leakage and corrosion of the battery box and pole piece.

Strictly avoid collisions, moisture, etc.

Factory reset operation

In actual use, if the measurement error or deviation is large, it may be due to misoperation or other reasons caused by internal data errors, and the operation of restoring factory setting parameters is as follows:



After pressing the key under the display of software information,  the instrument will be restored to the factory set parameters and automatically shut down at the same time.

Schedule 1

material		Velocity	
		In/us	m/s
aluminium	Aluminum	0.250	6340-6400
steel	Steel, common	0.233	5920
stainless steel	Steel, stainless	0.226	5740
brass	Brass	0.173	4399
copper	Copper	0.186	4720
iron	Iron	0.233	5930
cast iron	Cast Iron	0.173-0.229	4400-5820
lead	Lead	0.094	2400
nylon	Nylon	0.105	2680
silver	Silver	0.142	3607
gold	Gold	0.128	3251
zinc	Zinc	0.164	4170
titanium	Titanium	0.236	5990
tin	Tin	0.117	2960
Acrylic (class)		0.109	2760
epoxy resin	Epoxy resin	0.100	2540
ice	Ice	0.157	3988
nickel	Nickel	0.222	5639
Plexiglass	Plexiglass	0.106	2692
polystyrene	Polystyrene	0.092	2337
ceramics	Porcelain	0.230	5842
polyvinyl chloride	PVC	0.094	2388
quartz	Quartz glass	0.222	5639
Vulcanized rubber	Rubber, vulcanized	0.091	2311
polytetrafluoroet	Teflon	0.056	1422
water	Water	0.058	1473

Instrument configuration checklist

	serial number	Name	Remarks	quantity	
sign permi t match place	1	Ultrasonic thickness gauge host		1 unit	
	2	Ultrasound probes	5M	1 pcs	
	3	Couplant		1 pcs	
	4	Instruction manual		1 copy	
	5	Certificate		1 sheet	
	6	Instrument case		1 pc	
	7	No. 5 alkaline battery	Non-aer onautic al	Sectio n 2	
choose dispos ition	1	Communication cables			
	2	Communication software			

Supervisor:

Packer:

Checker:

Certificate of Inspection
HaiyiNo. 325

Manufacturer: Haian Discory Detection Instrument Co., Ltd

Product Name: Ultrasonic thickness gauge

Specifications and models:

Factory Number:

Test conclusion:

Main tube:

Inspection:

Verification:

Inspection date: y

Validity period: one year

Product warranty card

Date of filling in the card Year, Month, Day

Product name	Ultrasonic thickness gauge	Date of purchase	
Model number		Factory number	
Purchase unit		User name	
Contact number		Mobile	
Contact address		Postal Code	

Notes on Maintenance

Number of repairs	1	2	3
Symptom			
Handling the situation			
Repair date			
Maintenance personnel			

Warranty Card Description:

1. Warranty period: one year from the date of sale.
2. Warranty conditions: The user operates and keeps the instrument in full accordance with the provisions of the manual, and if there is a failure due to quality problems during the warranty period, the user will give the warranty with the warranty card or valid invoice.
3. Paid maintenance is carried out in the following cases:
 - (1) The warranty card or valid invoice cannot be presented.
 - (2) Instrument failure caused by the user's disassembly, maintenance and modification of the instrument.
 - (3) The failure of the instrument caused by improper storage.
 - (4) The user's failure caused by man-made damage, improper operation or irresistible natural disasters.
 - (5) Instrument failure beyond the warranty period of one year.
4. The user shall keep this card properly, and if it is lost, it shall not be altered.
5. The warranty card with the special seal of the factory's warranty is valid, and when the instrument needs to be repaired, it is repaired with this card and inspection certificate.
6. After-sales service telephone: 400-012-6866
7. Address: No. 159, Tan Gang Road, Haian City, Jiangsu Province.

After-sales service commitment

Dear customer:

Thank you very much for choosing our company's products, our company takes quality as life, reputation and development, service as the purpose, is our development criterion.

Our commitment

1. All production processes of our company strictly implement the ISO9001 international quality standard system, which fully complies with enterprise standards;
2. 24-hour telephone special line service, our company will provide our customers with the latest information and technical information at any time;
3. Our company can send professional and technical personnel to provide free operation guidance and technical training for users who purchase instruments;
4. Our company promises: from the date of purchase of the instrument, the warranty is one year, lifelong maintenance;
5. Provide long-term high-quality technical support to users, and provide relevant spare parts to users at any time;
6. Timely follow-up service, regular investigation of the market, listening to feedback and suggestions, and then improve and adjust;
7. Online acceptance, online clarification, expert guidance;

After-sales service items

1. 24-hour technical service hotline (400-012-6866).

When the after-sales service personnel receive the fault and repair call, they will immediately arrange the engineer to call back and make a preliminary judgment on the fault, if there is no need to solve it on site, it will be solved by telephone and other methods within 4 hours.

If you need to solve it on site, you can contact the technical engineer to rush to the site. Provincial capitals are resolved within 24 hours, other cities within 48-72 hours.

If a hardware failure occurs, technical engineers can be arranged to rush to the site with spare parts to ensure that the problem is solved for customers within 2 working days.

2. Email (postmaster@dscr.com.cn).

Provide users with email-based technical support services, and the response time of user help e-mail is 12 hours.

- 3 Website (www.dscr.com.cn).

Provide customers with product technical introductions

4. Fax (0513-88931551).

Provide users with technical support services based on fax, users use fax for technical communication for help, and the response time is 4 hours.

5. Emergency on-site service

In the event of an emergency or an event that cannot be solved by other support methods, we provide on-site service and arrive at the customer's site as soon as possible

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Lead the industry benchmark

Build international brands

Address: #159 TanGangLu HaiAnZhen JiangSu China

Phone: +86-513-88931553 88931552

Fax: +86-513-88931551

Website: [Http://www.dscr.com.cn](http://www.dscr.com.cn)

Zip code: 226600