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Ultrasonic Thickness Gauge for Steel

Product Overview

Ultrasonic thickness gauges for steel utilize the pulse reflection principle of ultrasound for material measurement. When ultrasonic pulses emitted by the probe penetrate the measured object and reach the material interface, they are reflected back to the probe. By precisely measuring the propagation time of ultrasound through the material, the thickness of the measured material can be determined. These instruments are primarily used to measure the thickness of metals (such as steel, cast iron, aluminum, copper), plastics, ceramics, glass, fiberglass, and any other ultrasonic conductors. They find extensive applications across various industries including petroleum and petrochemicals, automotive manufacturing, shipbuilding, aerospace, rail transit, metallurgy, mechanical processing, and container/piping systems.

Features

- With pulse echo measurement (P-E), interface echo measurement (I-E), and echo echo measurement (E-E) functions, it can accurately measure the substrate, penetrate the coating to measure the thickness of the substrate (not supported by the basic version), and measure the thickness of the substrate and coating at the same time (coating version)
- Real-time temperature compensation function can eliminate measurement errors caused by probe temperature changes in time. The probe can be used normally after factory calibration without frequent calibration operation.
- 16 gain levels and 7 emission levels can be adjusted according to the actual measurement of the workpiece, so as to achieve the best measurement effect in different scenarios
- Supports a variety of single crystal and dual crystal probes, with multiple sets of built-in calibration relationships, which can be used with a variety of different frequencies and different wafer sizes probes
- It has probe calibration and two-point calibration functions, and can automatically correct the system error
- It is known that thickness can reverse the sound velocity to improve the measurement accuracy
- There are single point measurement, scanning measurement, upper limit scan, lower limit scan, boundary scan, difference measurement and other measurement methods
- Support keyboard lock function to avoid parameter setting changes caused by accidental touch during measurement
- The upper and lower limits of thickness value can be preset, and the automatic buzzer alarm will be triggered when the thickness measurement value exceeds the range
- The display information is rich, including thickness value, sound velocity, coupling state, effective number of echoes, power state, time and so on
- The measurement results can be completely saved, including the measurement thickness, the measurement sound velocity, the measurement time, etc
- Can be connected to portable thermal printer, print the stored measurement results
- It can communicate with PC or smart terminal through Bluetooth or Mini-USB interface, send measurement results to PC or smart phone in real time, and send instructions to the instrument for remote control through PC or smart phone (instruction version)
- Intelligent voice broadcast (voice version) can be used to report the measurement results
- It can directly measure the sound velocity of the specimen with known thickness, and support the display of spheroidization grade. It can be used to assist in judging the spheroidization rate and spheroidization grade of ductile iron (sound velocity version)
- Supports the measurement lower limit function, which can be used to measure parts with more internal defects (castings, glass fibers, etc.) or multi-layer parts (measurement lower limit version)
- Can be customized software and hardware, including power supply modification, communication interface modification, communication protocol customization, etc

Note: For specific versions and functions, please refer to the following feature version comparison

Technical Parameter

- Probe specifications: S15-P06①, G5M-P10, G5M-P08, G7M-P06, G2M-P12, H3M-P12, S2M-P14①
- Measurement range: 0.15-2000mm (refer to the technical parameter table of the probe)
- Measurement error: related to probe parameters, refer to the technical parameter table of the probe
- Display accuracy: 0.001mm and 0.01mm (optional)
- Measurement mode: P-E, I-E①, E-E①, AUTO①, E-C①②, C-E①②
- Measurement cycle: P-E mode 4 times per second; other modes 2 times per second
- Speed range: 1 ~ 19999 m/s
- Sound velocity measurement: reverse sound velocity measurement, direct measurement of sound velocity ③
- Calibration function: probe calibration, two-point calibration, built-in calibration test block (steel)
- Measurement parameters: 16 gain levels adjustable, 7 transmission levels adjustable
- Measurement method: single point measurement, scanning measurement, upper limit scan, lower limit scan, boundary scan, difference measurement, can be set to exceed the limit alarm, can be set to the lower limit ④
- Screen display: Chinese and English menus can be switched, FSTN LCD display, with cold light source illumination backlight
- Display information: thickness, sound velocity, coupling status, effective number of echoes, power status, time, etc
- Data storage: 1000 sets of measurement results (5 files, each with 200 sets) including thickness measurements, measurement of sound velocity, measurement time and other relevant information
- Data communication; Bluetooth / Mini-USB interface, virtual serial port communication, support real-time online measurement, support command control⑤, host program can be upgraded
- Data printing: optional portable thermal printer
- Charging time: 3~4 hours
- Working power: 3.7V rechargeable lithium ion battery, can work for 80 hours (without Bluetooth, backlight)
- Automatic shutdown: automatic shutdown when standby time exceeds (the automatic shutdown time can be adjusted), automatic shutdown when voltage is low (below 3.4V)
- Environment temperature: Use temperature: -10 ~ 50 ℃, storage temperature: -30 ~ 60 ℃
- Shape size: 157mm * 78mm * 37mm

- Weight: 260 grams
- Shell material: ABS
- Instrument box material: high impact ABS (IK08), waterproof and dustproof (IP67)

Comparison of functions in different versions

(Multiple functional versions can be superimposed, for example: PD-T7-CLS represents coating version + measurement lower limit version + sound velocity version)

Name suffix	edition	functional description
not have	standard edition	Contains all standard functions, other versions are based on this
-B	Base edition	Coat penetration measurement is not supported and single crystal probe is not supported
-C	Coating edition	Support coating thickness measurement, can measure the thickness of substrate and coating at the same time
-L	Measuring the lower limit	Supports the measurement lower limit function, which can set the measurement lower limit gate
-O	Directive edition	Support the communication instruction control function of the host computer
-S	Sound Speed Edition	Supports the sound velocity measurement function, which can be used for sphericity rate and sphericity grade evaluation
-V	Voice version	Supports Chinese voice broadcast function
-4	RS485	RS485 communication interface

Probe technical indicators

(The measurement range is related to the properties of the measured material, coupling condition and other influencing factors. The measurement range of 45# steel is shown in the table.)

Probe specifications		S15-P06	S2M-P14	G5M-P10	G5M-P08	G7M-P06	G2M-P12	H3M-P12
Type of probe		single crystal	single crystal	macle	macle	macle	macle	macle
measuring range		0.15~28 mm	30~2000 mm	0.8~300 mm	0.8~225 mm	0.8~50 mm	3.0~700 mm	2.0~200 mm
measure error	H<10mm	0.01mm	-	0.03mm	0.03mm	0.03mm	0.05mm	0.05mm
	H≥ 10mm	0.3%H	0.5%H	0.3%H	0.3%H	0.3%H	0.5%H	0.5%H
Extrusion outer diameter		8mm	19mm	13mm	11mm	9mm	17mm	15mm
measuring		15MHz	2MHz	5MHz	5MHz	7.5MHz	2MHz	3MHz

frequency							
Contact temperature	-10~60°C	-10~310°C	-10~60°C	-10~60°C	-10~60°C	-10~60°C	-10~310°C
scope of application	High precision measurement or measurement of ultra-thin workpieces and small pipe fittings	No delay block, measure super thick workpiece	Measure routine workpieces	Micro diameter probe, both curved and conventional measurements	Micro diameter probe, measuring curved surfaces and small workpieces	Coarse crystal probe, measuring castings and thicker workpieces	High temperature probe, measuring high temperature workpiece

Standard Layout

Main engine	1 unit
Ultrasonic thickness probe 1 (select according to working conditions, can be selected)	1 share
C coupling agent (bottle)	1 bottle
Random data (instruction manual, warranty card, certificate of conformity)	1 set
Charger	1
Communication cable	1 root
ABS shockproof waterproof instrument box	1

Maintenance

1. Please do not use sharp objects to carve the display screen;
2. The instrument and probe should be avoided from strong vibration;
3. Avoid placing the instrument in a humid environment;
4. When inserting or removing the probe, you should hold the movable sleeve along the axis and press hard, and do not rotate the probe to avoid damaging the cable core wire of the probe;
5. The attachment of oil and dust will make the probe wire gradually aging and breaking, so the dirt on the cable should be removed after use;