SW6 Ultrasonic Thickness Gauge

SW6 is a high-precision ultrasonic thickness gauge independently developed by Qingcheng Ltd, which is suitable for various materials high-precision measurement needs. The thickness of the workpiece can be measured quickly and accurately only by placing the probe on the contact surface on one side of the workpiece.

Main Features

- SW6 is suitable for thickness measurement of almost all materials, such as metal, glass, plastic, rubber, and other materials.
- High measuring accuracy, large measuring range; Suitable for flat surface workpieces or pipe walls thickness measurement.
- A variety of probes are available, suitable for special thickness measurement applications, including coarse grain materials such as gray cast iron and high temperature environment measurement (temperature up to 300℃) applications.
- **Probe self-adaptive functions:** automatic matching different manufacturers of various types of probes, including identifying the sensitivity and frequency of probe, automatic adjusting the thickness gauge parameter settings, to reach the best measuring effect.
- **Power-on self-check function**, which help to improve the measurement accuracy.
- Automatic shutdown time can be set up according to user's needs.
- Probe zero automatic calibration, sound velocity calibration function.
- Built-in 9 kinds of materials of sound velocity, and convenient to fast measurement.
- Various measurement modes: standard measurement mode, scanning mode, differential measurement mode, the average measurement mode, extremum alarm mode, high temperature measurement model (with high temperature probe).
- Humanized design of keyboard button, simple and convenient: zero calibration, single point and two points calibration sound velocity.
- High-capacity data storage, data storage capacity of up to 2000 groups.
- USB data transmission interface, easy connect with computers for data export. (data format. TXT).
- Metric/inch optional: display unit can choose between mm and inches.

Thickness measuring range

- 0.65～500mm (Steel)
- 0.3～200mm (Glass)
- 3～50mm (Cast iron)
- 4～80mm (High temperature)

Note: The thickness measurement range for different materials depends on the performance of the probe as well as the material surface condition and the ambient temperature measured.

Optional probe

Probe type	Specification	Measuring range	Probe diameter	Frequency	Temperature
Standard type (suitable for coating workpiece)	5M，Φ10	0.7～400mm 3.0～50mm (penetrating coating)	10mm	5MHz	-10～+50℃
Small-diameter type	5M，Φ6	0.70～60mm	6mm	5MHz	-10～+50℃
Standard type	2.5M，Φ12	3.0～500mm	12mm	2.5MHz	-10～+50℃
Micro-diameter type	7.5M，Φ6	0.65～25mm	6mm	7.5MHz	-10～+50℃
High precision type	7.5M，Φ10	0.65～250mm	10mm	7.5MHz	-10～+50℃
High temperature type	ZW5P	4.0～80mm	12mm	5MHz	-10～+300℃
Special cast iron type	2M，Φ22	3.0～50mm（cast iron）	22mm	2MHz	-10～+50℃

Technical parameters

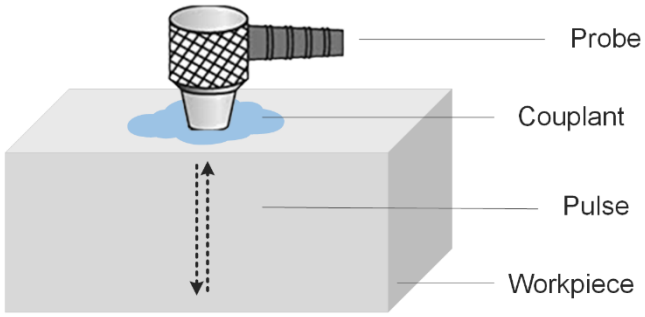
Sound velocity	509～18699m/s, settable
Measurement accuracy	±(0.5%H+0.05) mm (H means the thickness of the testing workpiece)
Display precision	0.01mm or 0.001inch
Receive bandwidth	1MHz～10MHz（-3dB）
Lower limit of steel pipe measurement: (Probe: 5MHz, Φ10mm)	The diameter should be at least 15mm, thickness should be more than 2mm
Measurement frequency	2 ~ 20 times/s, settable
Power source	3V DC (two AA alkaline batteries)
Screen display	128×64 dot matrix LCD
Working hours	● 280 hours (Backlight off) ● 100 hours (Backlight on)
Applicable temperature	● -10℃ ~ 50℃ (Ambient temperature) ● -10℃ ~ 300℃ (High temperature)
Operating humidity	20% ~ 90%RH
Dimension	136(L) mm×72(W) mm×20(H)mm
Weight	176g (including battery)
Built-in test block thickness	3mm

Measuring Principle

The principle of the ultrasonic thickness gauge is to generate ultrasonic pulses through the probe. The pulse enters the workpiece from the contact surface of the probe and the workpiece, propagates in the workpiece along the thickness direction, and reflects on the other surface of the workpiece. By measuring the total time **(t)** of the ultrasonic pulse

propagating in the workpiece and the velocity **(v)** of the ultrasonic pulse, we can obtain the relationship between the thickness **(H)** of the workpiece with the time **(t)** and velocity **(v)**:

$$H = vt/2$$



Where:

H - Thickness of the test workpiece.

v - Sound Velocity in the workpiece.

t - The measured round-trip transit time

Note: To make sure the probe working properly it needs to use couplant to isolate the air between the probe surface and the measured workpiece surface.

Applicable condition

- The surface of the measured workpiece should be clean. If it is rough or seriously corroded, coupling agent should be reapplied on the surface, or clean up the surface of the measured workpiece with rust remover, wire brush or sandpaper.
- Ensure that the surrounding environment has no strong vibration, no strong magnetic field, no corrosive media, and serious dust.
- The probe should be selected according to the thickness and shape of the measured workpiece.
- When measuring at ambient temperature, the surface of the measured object should not exceed 50°C, otherwise it will damage the probe. If the probe is worn, the measurement value will be unstable. At this time, the probe should be replaced.