ALPHA ENGINEERING AND SYSTEMS PVT. LTD.

Ultrasonic Thickness Gauge

AES 222A

Introduction:

Ultrasonic Thickness Gauge measuring with ultrasonic wave, is applicable for measuring the thickness of any material in which ultrasonic wave can be transmitted and reflected back from the other face. The gauge can provide quick and accurate measurement to various work pieces such as sheets of board and processing parts. Another important application of the gauge is to monitor various pipes and pressure vessels in production equipment, and monitor the thinning degree during using. It can be widely used in petroleum, chemical, metallurgy, shipping, aerospace, aviation and other fields.

Technical Specification:

- Display：128*64 LCD with LED backlight;
- Measuring Range：(0.75~600)mm（Steel）
- Velocity Range：(1000~9999) m/s;
- Resolution：0.01mm
- Measuring accuracy：：±（0.5%H+0.04mm);H is thickness value;
- Measurement cycle：Single point measurement 6 times/per;
- Storage：3000 values of saved data
- Connect: R232 port
- Power Source:2pcs 1.5V AA size
- Working Time:more than 50 hours (LED backlight off).
- Outline Dimensions:145mm*74mm*32 mm
- Weight：245g

Main Functions:

- Capable of performing measurements on a wide range of material, including metals, plastic, ceramics, composites, epoxies, glass and other ultrasonic wave well-conductive materials.
- Can collocate variety different frequencies, wafer sizes of probes;
- Sound Velocity Calibration function as a known thickness
- Coupling status indicator showing the coupling status
- EL backlight, and convenience to use under dark environment
- Have the battery indicator function, can real-time display the remaining power
- Auto sleep and auto power off function to conserve battery life
- Smart, portable, high reliability, suitable for bad environment, resist to vibration, shock and electromagnetic interference.

Primary Theory:

The digital ultrasonic thickness gauge determines the thickness of a part or structure by accurately measuring the time required for a short ultrasonic pulse generated by a transducer to travel through the thickness of the material,reflect form the back or inside surface, and be returned to the transducer.The measured two-way transit time is divided by two to account for the down-and-back travel path,and then multiplied by the velocity of sound in the material.
The result is expressed in the well-known relationship:

$$H = \frac{v \times t}{2}$$

Where: H—Thickness of the test piece.
v----Sound Velocity in the material.
t----The measured round trip transit time.

Instrument Configuration:

	No.	Name	QTY	Notes
Standard Configuration	1	Main Body	1 set	
	2	Standard Probe（5MHz,D10mm）	1 pc	
	3	Couplant	1 pc	
	4	ABS Case	1 pc	
	5	Product Certificate	1 pc	
	6	Warranty Card	1 pc	
	7	Manual	1 pc	
	8	1.5V AA size	2 pcs	
Optional Accessories	9	Large diameter probe（2.5MHz）		
	10	Large range probe（2MHz）		
	11	Micro-diameter probe（7MHz）		
	12	High temperature probe（5MHz）		
	13	High temperature couplant		

The choice to probes:

Name	Model	Frequency	Diameter	Testing Range	Min. area ϕ	Application
Large diameter probe	N02	2.5	14mm	3.0mm～400.0mm（steel） Below 40mm(Gray Iron HT200)	20mm	casting work piece
Large range probe	N02	2	14mm	3.0mm～600.0mm（steel） Below 100mm(Gray Iron HT200)	20mm	casting work piece
Standard probe	N05/90°	5	10mm	1.0mm～230.0mm（steel）	Φ20mm*3.0mm	General bent probe
Micro-diameter probe	N07	7	6mm	0.28mm～80.0mm（steel）	Φ15mm*2.0mm	thin work piece
High Temperature Probe	HT5	5	14mm	3～200mm （steel）	30mm	high temperature

Working Conditions:

Working Temperature:－20℃~＋50℃
Storage Temperature:-30℃~＋70℃
Working Humidity:≤90％;
On surrounding, need to no strong vibration, strong magnetic field, corrosive medium or severe dust.

Sound Velocity:

Material	Velocity	
	in/μs	m/s
Aluminum	0.250	6340-6400
Steel, common	0.233	5920
Steel, stainless	0.226	5740
Brass	0.173	4399
Copper	0.186	4720
Iron	0.233	5930
Cast Iron	0.173-0.229	4400-5820
Lead	0.094	2400
Nylon	0.105	2680
Silver	0.142	3607
Gold	0.128	3251
Zinc	0.164	4170
Titanium	0.236	5990
Tin	0.117	2960
	0.109	2760
Epoxy resin	0.100	2540

Ice	0.157	3988
Nickel	0.222	5639
Plexiglass	0.106	2692
Porcelain	0.230	5842
PVC	0.094	2388
Quartz glass	0.222	5639
Rubber, vulcanized	0.091	2311
Water	0.058	1473