PHYNIX

Physikalische Oberflächen-Messtechnik
Physical Surface Testing Technology

MANUAL

TT-110

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1. GENERAL

1.1 SCOPE OF APPLICATIONS

The handheld microprocessor-controlled thickness gauge is designed for measuring the thickness of steel only.
The DELTA TT110 can be used in industrial applications to perform precise measurements on parts and components, and it can also be used to monitor various kinds of pipes and pressure vessels for the decrease of their thickness due to corrosion and/or erosion.

1.2 BASIC WORKING PRINCIPLE

The principle of ultrasonic wave in the thickness measurement is simular to that of optical wave. The ultrasonic wave pulses transmitted by the probe reach the object to be measured and propagate in the object and when they reach the interfaces, they are reflected back. The thickness of the object is determined by precisely measuring the time the ultrasonic wave travels in the object.

1.3 BASIC CONFIGURATION AND PART DESCRIPTION OF THE TT110

Basic configuration:	tester:	1 piece	
	DISPLAY:	batt	888.8
	probe:	1 piece	
		mm	
	coupling agent:	1 bottle	

LCD screen display:	BATT	: low voltage indication
		: coupling indication for satisfactory acoustic coupling between probe and test piece
	m / s	: measurement unit of sound velocity: 5900 m/s
	m m	: measurement unit of thickness
Keyboard:	ON	: power key
	ZERO	: probe zero procedure

1.4 PERFORMANCE PARAMETERS

Display type	: 4-digit LCD
Minimum display unit	: 0.1 mm
Measuring range	: 1.0 mm - 225.0 mm in steel (with standard probe)
Lower limit for steel pipes	: minimum dia. 20 mm x 3 mm thickness
Display accuracy	: 1% H + 0,1mm
Sound velocity	: 5900 m/s
Coupling check	: satisfactory / no probe coupling
Operating temperature	: 0 - 40 °C
Working frequency	: 5 MHz
Update rate	: 4 Hz
Power supply	: 2 AA alkaline cells 1.5 V
Battery life	: 250 hours with one battery set
Dimensions	: 126 x 68 x 23 mm

1.5 MAIN FUNCTIONS

1) Automatic probe zero adjustment: automatic correction to the system errors.
2) Automatic linear compensation within the full range, computer software is used to correct the non-linear errors of the probe for the purpose of improving the accuracy.
3) Coupling indication: the stability can tell if the coupling is normal.
4) Indication at low voltage.
5) Automatic switch off.
6) Oil proof keyboard with longer service

2. MEASURING STEPS

2.1 PREPARATIONS FOR MEASUREMENT

Connect the probe sockets to the connectors on top of of the unit. Connect the transmitting socket (colour = red) at the connector positioned at right, and the receiving socket (no colour) to the connection position left, holding the tester display in front.

* Push ON-key to turn on the unit.

As it is shown in the figures below, after the full screen display for a few seconds, the screen will display the sound velocity used the last time. The measurement can start now, but read other paragraphs first.

BATT
888.8 >> 5900
m/s mm m/s

Note:
The surface of the probe is made of propylene resin and is very sensitive to heavy scratches on rough surfaces, so in application, push the probe gently on the surface.

Automatic turn off
If within 2 minutes no operation is performed, the unit turns off automatically.

2.2 CALIBRATION

Each time the probe or battery is changed, calibration should be performed.
This step is rather critical for the guarantee of the measuring accuracy. If necessary, calibration can be repeated several times. Take following steps:

* Put a little coupling agent on the steel master testing block on the unit, which has a thickness of 4.0 mm.
* Push ZERO key to enter into the state of calibration and then the screen displays:
  - - - - -
* Coupling the probe with the testing block. At this time the bar lines displayed on the screen will disappear one after the other until the screen displays 4.0 mm. This indicates that the calibration is over:

  - - - - > - - - > - - > - > > 4.0
  m m

Note:
When the probe couples with the material to be measured, the coupling indication sign will be displayed on the left side at the display. If the coupling indication flicks or does not appear, it shows that the coupling is not well done. Take the probe away, the thickness value will remain and coupling indication will disappear.

3 MAINTENANCE

3.1 LOW VOLTAGE INDICATION

If Batt is displayed on the screen, it shows that the battery voltage is running low and the batteries should be replaced in time before the unit can be used again.

Battery replacement:

a) Wait until the unit turns off automatically.
b) Open the battery compartment (use the thumb to press down the compartment cover and slide it out).
c) Remove the used batteries and put in new batteries. Note the polarity of the battery.

3.2 PRECAUTIONS

* The surface of the probe is made of propylene resin and is very sensitive to heavy scratches on rough surfaces, so in application, push the probe gently on the surface.
* The temperature of the surface of the object to be measured should not exceed 60 degrees C, otherwise the probe will not be workable.
* Dust, iron chips and carbon particles will cause trouble; keep unit clean all the time.
* Grease, oil and dust will make the cable of the probe aged and cracked, therefore, after the use, the cable should be cleaned of dust and dirt.
* If the unit is not to be used for a long time, remove the batteries.
* Stricktly avoid any collision or damp environment, etc.

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