

AD-3253

INSTRUCTION MANUAL

ULTRASONIC THICKNESS GAGE

AND

A&D Company, Limited

841-1A-1E.1995.AUGUST



This is hazard alert mark.



This is information mark that inform to you about the operation of AD-3253.



This is notice mark that inform to you on the operation of AD-3253.

Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. If this unit is operated in a residential area it might cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.

(FCC = Federal Communications Commission in the U.S.A.)



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1 Introduction

Thank you for purchasing an A&D product. Before operating this device, read this manual thoroughly. This is the instruction manual for the AD-3253 ultrasonic thickness gage.

The AD-3253 is a small, easy-to-use precision thickness gage offering high performance and many functions.

Note: The contents of this manual are subject to change without notice.



1-1 Features

- ◇ Simple operation
To start the measuring is a power-ON operation only because AD-3253 have automatic start up self check program.
- ◇ Sound Velocity Adjustment
The thickness which is unknown sound velocity is able to measure if you have some material and know this thickness of sample.
- ◇ Auto-power-off
AD-3253 turns off automatically, of you do not operate for five minutes.
- ◇ Memorization of sound velocity
The sound velocity are stored in AD-3253 during power-off by batteries.



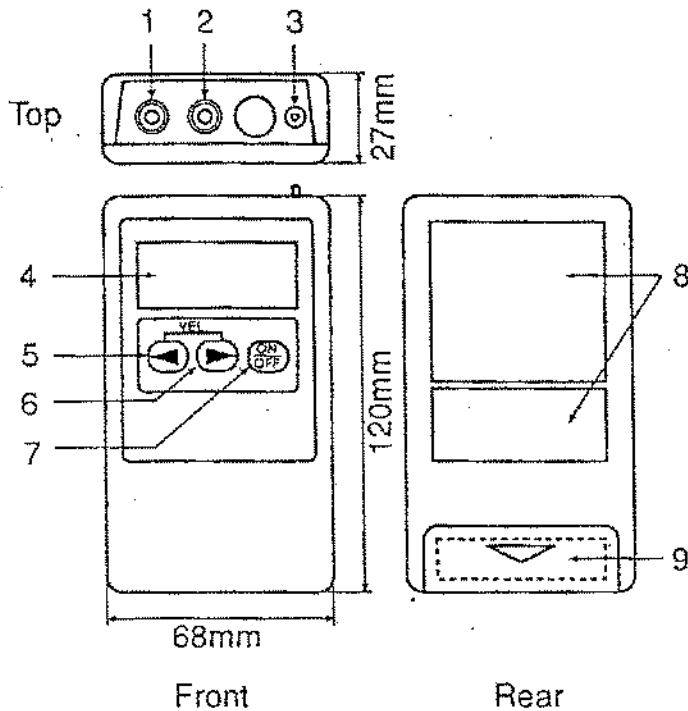
1-2 Unpacking thickness gage

Do not make a shock because this product is sensitive. Keep the packing material if you want to transport the thickness gage again in the future.

In the carton you should find this manual plus.

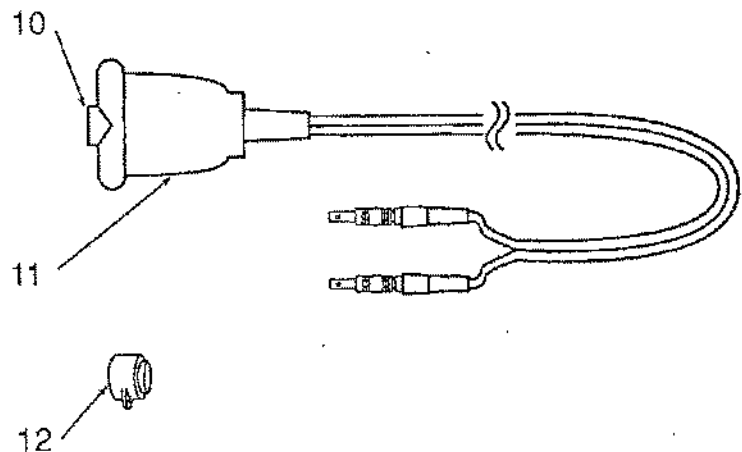
Main unit	1
Dual element probe	1
Probe holder	1
Soft case	1
Test piece (5mm)	1
Inspection report	1

1-3 Description



- 1 Probe connector (red, for transmission)
- 2 Probe connector (green, for reception)
- 3 Strap terminal (with wrist strap)
- 4 LCD display (see "LCD display")
- 5 ◀ Key decreasing the velocity.
- 6 ▶ Key increasing the velocity.
- 7 [ON/OFF] Key Power ON/OFF switch.
- 8 Label the serial number of the AD-3253 and velocity value are printed on the label.
- 9 Battery cover Keep the battery cover on except when changing battery.

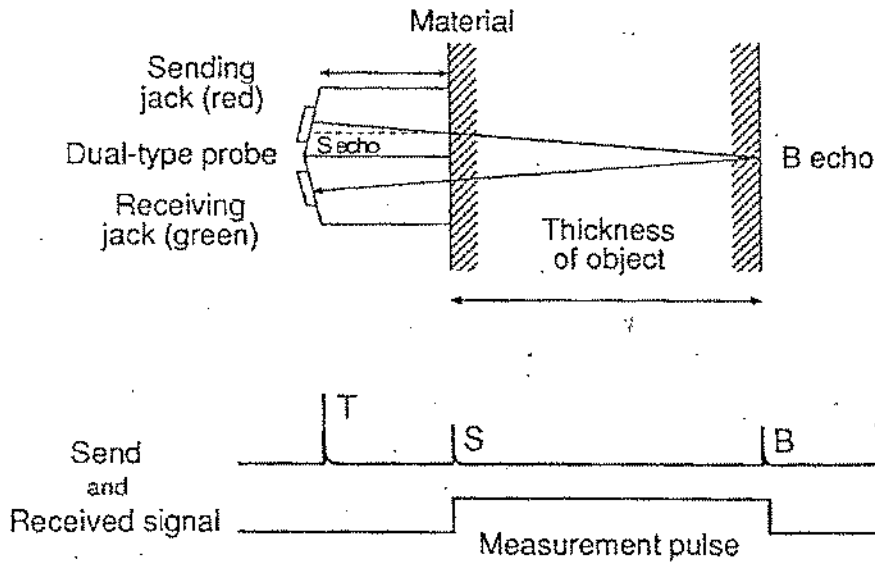
- 10 Dual-type probe.
- 11 Probe holder.
- 12 Test piece (5mm).





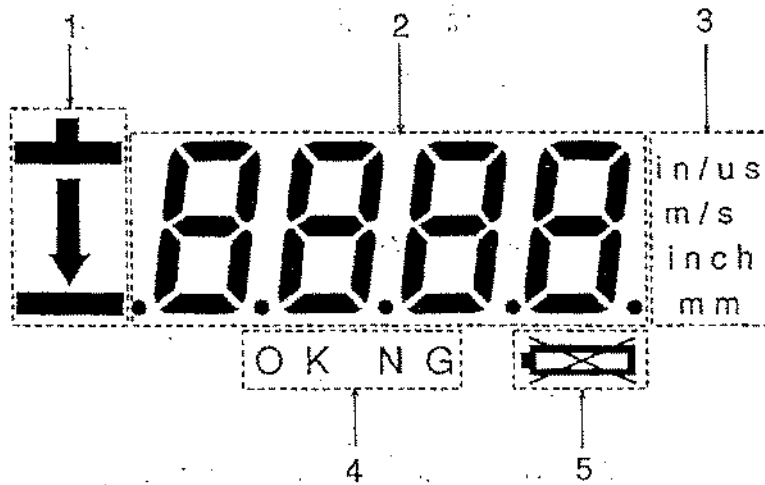
1-4 Measurement Principle

An ultrasonic pulse (T pulse) is output from the pulser to the object through the sending transducer of the probe. The ultrasonic pulse (B echo) reflected by the bottom of the object is received and amplified by the receiving transducer of the probe, then input to the time measurement block. The delay caused by the material is subtracted from the time between reception of the T pulse and reception of the B echo, then the result is converted to a measured value and displayed on the LCD display.





1-5 LCD Display



1 Coupling Condition.

The condition of probe and coupling with object. If not measuring any object or coupling with the object is improper, the following mark will be displayed:

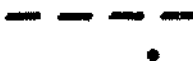


If measuring an object properly, the following mark will be displayed:



2 Measured Value

10.0 mm (This displays the measuring thickness.)



This displays coupling error.

5920. m/s (This displays sound velocity. (Factory setting))


3 Units

Thickness or sound velocity.

4 Calibration

This displays the condition of calibration and this result.

5 "Check Batteries" Mark.

The "check batteries" mark [] will be displayed when the batteries are running low. After about one hour of use, the AD-3253 will turn off automatically.



2 Method of Measurement



2-1 Setting up

1. Install the battery in main unit
Open the battery cover and insert one R6P type battery as indicated inside the battery compartment.
2. Connect the probe to the main unit
Connect the probe to the probe connectors on the top of the main unit. Connect the red jack to the red connector and the non-color jack to the green connector.



Do not disassemble, heat up or throw the battery in fire because of danger of explosion and leakage.



2-2 Measurement

1. Press the [ON/OFF] key, AD-3253 enters thickness gage mode. Caution if the probe do not connect to main unit, AD-3253 display error.
2. Place the probe directly on the object to be measured. Apply the couplant (oiler) and touch the probe on the object.



5.0 mm



It is necessary to apply the couplant on the surface in order to send ultrasonic pulse into the object.

3. Press the [ON/OFF] key, then AD-3253 turn OFF.



2-3 Velocity Calibration

If the velocity of the object to be measured is not known, the velocity must be calibrated.

1. Prepare the test piece for velocity calibration. This test piece must be made from the same materials as those of the object to be measured and its surface condition must be good.
2. Measure the thickness of the test piece with vernier calipers.
3. Put a drop of couplant on the test piece.
4. Touch the probe to the object that is same material and you know this thickness.
5. Adjust the thickness value by ► key or ◀ key. So as to display same thickness value of sample piece.



2-4 Velocity Display

- 1 Press the ◀ key and ▶ key same time at displaying thickness value. The display changes to velocity display.
- 2 Use the ◀ key and ▶ key when display change the velocity value.
- 3 Press the ◀ key and ▶ key same time. AD-3253 displays thickness value.



2-5 Initialize of velocity

- 1 Press the [ON/OFF] key with the ◀ key and ▶ key.
AD-3253 turn on and displays velocity value.
- 2 Release the ◀ key and ▶ key.
- 3 AD-3253 display initial velocity value (5920 m/s, 0.2331 inch/us).



2-6 Units changing

Setting for unit "mm"

- 1 Press the [ON/OFF] key with the ◀ key.
- 2 Release the ◀ key when AD-3253 display velocity.
- 3 Then AD-3253 display unit "mm".

Setting for unit "inch"

- 1 Press the [ON/OFF] key with the ▶ key.
- 2 Release the ▶ key when AD-3253 display velocity.
- 3 Then AD-3253 display unit "inch".



3 Caution

- Use the main unit and dual element probe of standard accessory in the pack. The operation without standard accessory may cause not to measure sufficiently. Make a pair of main unit and standard accessory when you request a repair.
- Avoid a rash temperature shock, a shock, lot of water and oil.
Do not drop the connector, main unit in the water. This product is not waterresist.
- Do not drop the main unit.
- Do not pull the probe cable.
- Do not use solvents to clean the thickness gage. Warm water with a mild detergent using a lint free cloth is best for cleaning.
- Remove the battery of no use long time.



4 Specifications




4-1 Thickness measurement specifications

Measurement method:	Ultrasonic pulse reflection method.
Measurement unit:	mm or inch.
Frequency:	5MHz.
Measurement frequency:	App., 4 time/sec.
Measuring range:	2.0 mm ~ 200.0 mm (0.08 inch ~ 8 inch).
Measuring accuracy:	±0.1 mm ±1.0 % (Range: 2 mm ~ 100 mm). ±0.1 mm ±1.5% (Range: 100 mm ~ 200 mm). ±0.01inch ±1.0 % (Range: 0.08 inch ~ 4 inch). ±0.01inch ±1.5% (Range: 4 inch ~ 8 inch).
Display resolution:	0.1 mm (0.005 inch).
Velocity range:	2,000 m/s ~ 9,999 m/s



4-2 General specifications

Display:	Segment LCD.
Power supply:	One R6P or LR6 battery.
Battery life:	Min. 30 hour (continuous) in measuring (5 mm, 25°C).
Automatic power off:	Power is automatically turned off after 5 minutes of non-use.
Battery check:	Replace battery when the [] (check battery) mark appears on the display.
Operating temperature range:	0°C~50°C,RH. less than 85%(Non-Condensing).
Keeping temperature range:	-10°C~55°C.
Dimensions:	68mm x 120mm x 27mm (WxHxD).
Weight:	App.180g.



4-3 Standard accessories

Dual element probe -----	1
Probe holder -----	1
Test piece (5mm) -----	1
Soft case -----	1
Inspection report -----	1
Instruction manual -----	1