



Standard Guide for Measuring Some Electronic Characteristics of Ultrasonic Testing Instruments¹

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1. Scope*

1.1 This guide describes procedures for electronically measuring the following performance-related characteristics of some sections of ultrasonic instruments:

1.1.1 Power Supply Section:

line regulation,
battery discharge time, and
battery charge time.

1.1.2 Pulser Section:

pulse shape,
pulse amplitude,
pulse rise time, pulse length, and
pulse frequency spectrum.

1.1.3 Receiver Section:

vertical linearity,
frequency response,
noise and sensitivity, and
dB controls.

1.1.4 Time Base Section:

horizontal linearity, and
clock (pulse repetition rate).

1.1.5 Gate/Alarm Section:

delay and width,
resolution,
alarm level,
gain uniformity,
analog output, and
back echo gate.

1.2 This guide complements Practice E317, D2548 and is not intended for evaluating the performance characteristics of ultrasonic testing instruments on the inspection/production line.

NOTE 1—No access to internal circuitry is required.

1.3 Units—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are

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mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D2548 Method of Test for Analysis of Oil Soluble Petroleum Sulfonates by Liquid Chromatography; Replaced by D 3712 (Withdrawn 1979)³

E317 Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Testing Instruments and Systems without the Use of Electronic Measurement Instruments
E1316 Terminology for Nondestructive Examinations

2.2 ISO Standards:⁴

ISO 10012 Measurement Management Systems—Requirements for Measurement Processes and Measuring Equipment

ISO 17025 General Requirements for the Competence of Testing and Calibration Laboratories

2.3 Other Standard:

IEEE Std. 100, IEEE Standard Dictionary of Electrical and Electronics Terms⁵

3. Summary of Guide

3.1 The electronic performance of each section is measured by identifying that portion of the electrical circuit of the instrument which comprises the section, applying the recommended stimulus or load, or both, and performing the required measurements using commercially available electronic test

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.

⁵ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., P.O. Box 1331, Piscataway, NJ 08854-1331

*A Summary of Changes section appears at the end of this standard