



Standard Specification for Transducers, Pressure and Differential, Pressure, Electrical and Fiber-Optic¹

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1. Scope

1.1 This specification covers the requirements for pressure and differential pressure transducers for general applications.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only. Where information is to be specified, it shall be stated in SI units.

1.3 *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.*

1.4 Special requirements for naval shipboard applications are included in Supplementary Requirements S1, S2, and S3.

2. Referenced Documents

2.1 *ASTM Standards:*²

D3951 Practice for Commercial Packaging

2.2 *ANSI/ISA Standards:*

ANSI/ISA S37.1 Electrical Transducer Nomenclature and Terminology³

2.3 *ISO Standard:*

ISO 9001 Quality System—Model for Quality Assurance in Design/Development, Production, Installation, and Servicing⁴

3. Terminology

3.1 Terms marked with (ANSI/ISA S37.1) are taken directly from ANSI/ISA S37.1 (R-1982) and are included for the convenience of the user.

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.10 on Electrical.

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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 Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁴ Available from International Organization for Standardization (ISO), 1 rue de Varembe, Case postale 56, CH-1211, Geneva 20, Switzerland.

3.2 Definitions:

3.2.1 Terminology consistent with ANSI/ISA S37.1 shall apply, except as modified by the definitions listed as follows:

3.2.2 *absolute pressure*—pressure measured relative to zero pressure (vacuum). (ANSI/ISA S37.1)

3.2.3 *ambient conditions*—conditions such as pressure and temperature of the medium surrounding the case of the transducer. (ANSI/ISA S37.1)

3.2.4 *burst pressure*—the maximum pressure applied to the transducer sensing element without rupture of the sensing element or transducer case as specified.

3.2.5 *calibration*—the test during which known values of measurands are applied to the transducer and corresponding output readings are recorded under specified conditions. (ANSI/ISA S37.1)

3.2.6 *common mode pressure*—the common mode pressure is static line pressure applied simultaneously to both pressure sides of the transducer for the differential pressure transducer only.

3.2.7 *differential pressure*—the difference in pressure between two points of measurement. (ANSI/ISA S37.1)

3.2.8 *environmental conditions*—specified external conditions, such as shock, vibration, and temperature, to which a transducer may be exposed during shipping, storage, handling, and operation. (ANSI/ISA S37.1)

3.2.9 *error*—the algebraic difference between the indicated value and the true value of the measurand. (ANSI/ISA S37.1)

3.2.10 *fiber-optic pressure transducer*—a device that converts fluid pressure, by means of changes in fiber-optic properties, to an output that is a function of the applied measurand. The fiber-optic pressure transducer normally consists of a sensor head, optoelectronics module, and connectorized fiber-optic cable.

3.2.11 *hysteresis*—the maximum difference in output, at any measurand value within the specified range, when the value is approached first with increasing and then with decreasing measurand. (ANSI/ISA S37.1)

3.2.12 *insulation resistance*—the resistance measured between insulated portions of a transducer and between the