



Standard Specification for Switch, Position Proximity (Noncontact) or Limit (Mechanical Contact), Fiber-Optic¹

This standard is issued under the fixed designation F2071; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers the requirements for fiber-optic position switches (proximity and limit). This specification does not include switches that transfer an optical signal from one path to another by an external force or energy applied to the switch.

1.2 Special requirements for naval shipboard applications are included in the Supplement.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard. Where information is to be specified, it shall be stated in SI units.

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.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D3951 Practice for Commercial Packaging

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.

2.2 ISO Standards:³

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

3. Terminology

3.1 Definitions:

3.1.1 *closed switch, n*—the light path is complete; signal from transmitter to receiver is complete.

3.1.2 *closed switch with positive alarm, n*—the light path is complete. Signal level indicates that the end faces of the sensing element are dirty and require maintenance for continued proper operation.

3.1.3 *fiber-optic position switch, n*—a device that converts measured position, via changes in fiber-optic properties, to an output that is a function of the applied measurand. The fiber-optic position switch normally consists of a sensor head, optoelectronics module, and connectorized fiber-optic cable.

3.1.4 *limit switch, n*—a switch that senses a change in position via mechanical contact.

3.1.5 *open switch, n*—the light path is blocked; signal from transmitter to receiver is not complete.

3.1.6 *optical transmittance change, n*—the change in optical power level introduced by an environmental, mechanical, or other induced stress.

3.1.7 *optoelectronics module, n*—unit of the fiber-optic position switch that contains the optical transmitter and receiver, and signal conditioning electronics, necessary to convert the sensed position to the specified output signal. The optoelectronics module may be an expansion card for a microprocessor-based system, or a stand-alone unit.

3.1.8 *proximity switch, n*—a switch that senses a change in position via noncontact means.

3.1.9 *sensor head, n*—unit of the fiber-optic position switch that detects position via changes in optical properties. The

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.