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British Standard: Aerospace Series
Specification for

# Proximity switches for aircraft

Part 1. General requirements

Interrupteurs de proximité pour les aéronefs 1ère Partie. Caractéristiques générales

Nahschalter für Flugzeuge Teil 1. Allgemeine Anforderungen

**Contents**



## Foreword

This British Standard has been prepared at the request of the Aerospace Industry Standards Committee and Society of British Aerospace Companies to cover class 1 proximity switches, for use in unprotected positions on aircraft, and class 2 proximity switches, intended for less arduous environment.

This Part 1 deals with the general requirements for all proximity switches and will be followed by Part 2 'Magnetic proximity switch requirements' and Part 3 'Inductive proximity switch requirements'. Further parts may be added, in due course, covering other basic methods of operation. This document takes account of Ministry of Defence (Procurement Executive) specifications, EL 2120 Magnetic Proximity Switches, and specification EL 2116 Inductive Proximity Switches.

Other Parts of the standard are:

Part 2 Magnetic proximity switch requirements.

Part 3 Inductive proximity switch requirements.

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## Specification

### 1. Scope

Part 1 of this British Standard specifies the general requirements for proximity switches suitable for use in nominal 28 V d.c. or 115/200 V, 400 Hz a.c. systems in aircraft.

Two classes of switch are specified: class 1, switches for use in unprotected positions on aircraft; class 2, switches intended for less arduous environmental conditions than class 1. The minimum requirements for class 2 switches are given in appendix C.

Requirements specific to a particular method of operation are given in the relevant further parts of this standard which must be read in conjunction with this Part 1.

### 2. References

This standard makes reference to the following British Standards.

BS 2011 Methods for the environmental testing of electronic components and electronic equipment

BS 6001 Sampling procedures and tables for inspection by attributes

BS 9150 Electrical relays of assessed quality: generic data and methods of test

2G 100 General requirements for electrical equipment and indicating instruments for aircraft.
- Part 2 Environmental and operating conditions

3G 100 General requirements for equipment for use in aircraft
- Part 0 Introduction
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- Part 2 All equipment
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- Part 3 Characteristics of aircraft electrical systems
- Part 4 Electric equipment
  - Section 1. Construction and general
  - Section 1.1 Electrical insulation tests
  - Section 2. Electromagnetic interference at radio and audio frequencies.

G 216 Hand operated thermally compensated, miniature single and triple pole circuit-breakers.

The following specification is also referred to in this standard.

EL 2011 Electric cables for aircraft – uniflexef-glasmet and uniflexefglas. [Obtainable from Ministry of Defence (Procurement Executive), St Giles Court, London].

### 3. Definitions

For the purposes of this British Standard the following definitions apply.

**3.1 proximity switch.** A switch system which provides one or more circuit switching functions when the target is brought within the declared operating region of the sensor. The system may include a separate relay or electronic module in addition to the target and sensor.

**3.2 target.** A specific material which is moved into proximity with the sensor in order to operate the switch.

**3.3 sensor.** A device designed to detect with the proximity of a target.

**3.4 electronic module.** An arrangement of solid-state electronic components which operates as a switch when actuated by an electrical signal from the sensor.

**3.5 overtravel.** The distance between the operating position and the total travel position.

**3.6 operating position.** The position, relative to the sensor, to which the target must be advanced in the intended direction of operation to cause subsequent operation of the switch. This may be reached by a head-on or a side-on approach of the target.

**3.7 release position.** The position of the target relative to the sensor to which the target must be withdrawn to de-operate the switch.

**3.8 differential travel.** The distance between the operating position and the release position.

**3.9 simultaneity.** The time interval between the first and last similar output circuit operation of the switch when operated by a target moving at 250 mm/s.

**3.10 ice shear force.** The force required to disrupt ice formation on either/or target and sensor that would prevent correct operation.

**3.11 response.** The interval between a target entering or leaving the operating region and the completion of the electrical switching functions.

**3.12 normal temperature, pressure and humditiy**

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|---|---|
| Temperature | 15 °C to 35 °C |
| Pressure | 86 kPa to 106 kPa (860 mbar) to (1060 mbar) |
| Humidity | 45 % to 75 % |

**3.13 vane operation.** A form of engagement of target and sensor in which one enters as a vane in a channel of the other.