BS EN 2350:2024

BSI Standards Publication

Aerospace series — Circuit breakers — Technical specification

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 26440 1

ICS 49.060

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2024.

Amendments/corrigenda issued since publication

Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 2350

October 2024

ICS 49.060

Supersedes EN 2350:1990

English Version

Aerospace series - Circuit breakers - Technical specification

Série aérospatiale - Disjoncteurs - Spécification technique

Luft- und Raumfahrt - Schutzschalter - Technische Lieferbedingungen

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European foreword

This document (EN 2350:2024) has been prepared by ASD-STAN.

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 2350:1990.

The main changes with respect to the previous edition are as follows:

— EN 2350 (P1), 09/1990 — General editorial improvements and update of Clause 2 and Bibliography.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this document: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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1 Scope

This document gives design information and specifies test methods for aircraft circuit breakers covered by European Standards. It is applicable if it is referred to in these standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2669, *Environmental tests for aircraft equipment — Steady-state acceleration*

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment*

IEC 60050-441, *International electrotechnical vocabulary (IEV) — Part 441: Switchgear, controlgear and fuses*

ASTM D740,[1] *Standard Specification for Methyl Ethyl Ketone*

ASTM D910,[1] *Standard Specification for Leaded Aviation — Gasolines*

MIL-PRF-7870C,[2] *Performance specification, lubricating oil: General purpose, low temperature*

MIL-PRF-23699F,[2] *Performance specification: Lubricating oil, aircraft turbine engine, synthetic base NATO code number O-156*

MIL-PRF-87937D,[2] *Performance specification: Cleaning compound, aerospace equipment*

SAE AMS1424G,[3] *Deicing/anti-icing fluid, aircraft, Newtonian — SAE Type I*

SAE AS1241C,[3] *Fire Resistant Phosphate Ester Hydraulic Fluid for Aircraft*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-441 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

[1] Published by American Society for Testing and Materials (ASTM International), available at: https://www.astm.org/.

[2] Published by Department of Defense (DoD), available at: https://assist.dla.mil/online/start/.

[3] Published by Society of Automotive Engineers (SAE), available at: https://www.sae.org/.

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3.1
circuit breaker with "trip-free release"
circuit breaker in which the "open" command takes precedence over the "close" command, i.e when the electrical trip condition is reached and pressure is exerted on the depressed actuator button, the circuit is still automatically opened

3.2
pole of a circuit breaker
any main circuit from the input to the pertinent output terminal

Note 1 to entry: The parts of each current path (contacts, sensors, switching parts) are independent and electrically insulated.

Note 2 to entry: There may be 1, 2 or 3 poles independently of any auxiliary circuits.

3.3
current rating
I_n
current for which the circuit breaker has been designed and designated

Note 1 to entry: Trip characteristics and test values are based on the current rating.

Note 2 to entry: Current is in amperes.

3.4
voltage ratings
voltage levels for which the circuit breaker is designed

Note 1 to entry: Insulation values and test voltages are related to these rated voltages.

Note 2 to entry: Voltage levels are in volts.

3.5
indication of current and voltage values
unless otherwise specified, the AC voltage and AC values shown are RMS values

4 Design

4.1 Insulating housing

In addition to the switching mechanism, the insulating housing shall incorporate the connecting and mounting systems.

4.2 Trip-free mechanism

The circuit breaker shall be designed to permit trip-free release, i.e. so that it is switched off at overload and remains switched off even when the button is held in the closed position. Resetting of the circuit breaker shall be possible only after complete release of the actuator button.

In no case shall operation under these conditions affect the further serviceability of the circuit breaker.

All poles of a multi-pole circuit breaker shall trip on single or multi-phase overload. The time lag between opening of the first and last pole shall not exceed 10 ms.

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4.3 Mounting

All visible parts shall be black and non-reflective.

4.4 Electrical connection components

These shall be suitable to fit the cable lugs (or contacts).

4.5 Actuator button

In the closed position, the visible part of the actuator button shall be black. In the "off" (open) position, a white strip shall be exposed. The outer part of this button shall be insulated from all live parts.

In no case shall the actuator button remain in an intermediate position or give an incorrect indication of the switching condition of the circuit breaker. It shall not be removable.

— The circuit breaker contacts shall be closed by pushing the actuator button.

— The circuit breaker contacts shall be opened by pulling the actuator button.

The current rating of the circuit breaker shall be indicated indelibly in white colour on the top of the actuator button. Arrangement of the digits is indicated in the product standard.

4.6 Calibration safety device

The circuit breaker shall be designed in such a way that the calibration cannot be interfered with without breaking a seal.

4.7 Leakage paths

Leakage paths and the minimum distance to be observed between live parts and all other parts of the circuit breaker in non-insulating materials and between live parts of opposite polarity shall be sufficient to avoid damage and spark-over under all operating and ambient conditions.

4.8 Insulants

Insulating parts shall be of non-inflammable or self-extinguishing materials and shall not emit noxious or explosive vapours.

They shall be resistant to fungus growth and the effects of microorganisms.

Protective coatings and materials which may chip, crack or shatter shall not be used.

4.9 Protection against corrosion

All metal parts shall be either resistant to or protected against corrosion.

In case of contact between dissimilar metals, they shall be protected against electrochemical corrosion.

Where bimetals are used, any corrosion which may occur shall not affect the proper function of the circuit breaker.

4.10 Fasteners

Screws and nuts shall be locked so that the connections cannot be damaged.

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