International Standard

ISO 1509

# General purpose push-pull three-pole circuit-breakers for aircraft — Performance requirements

*Disjoncteurs tripolaires à bouton-poussoir d'usage courant utilisés à bord des aéronefs — Caractéristiques*

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# Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 1, *Aerospace electrical requirements*.

This second edition cancels and replaces the first edition (ISO 1509:1973), which has been technically revised.

The main changes are as follows:

— ambient temperature and altitudes have been updated;

— operation forces have been updated;

— time/current characteristics have been updated;

— mechanical shocks test have been updated;

— high voltage and insulation tests have been updated;

— tests of temperature rise and minimum and maximum limit of ultimate trip current have been updated;

— operating forces test have been updated;

— mechanical strength tests have been updated;

— overload and re-closure test have been updated.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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# Introduction

This document provides performance requirements of the general purpose push-pull three-pole circuit-breakers normal ratings up to and including 35 A for aircraft.

The purpose of this document are as follows:

a) To standardize the requirements for push-pull three-pole trip-free circuit-breakers that are physically and environmentally diversified.

b) To provide the applicable document for push-pull three-pole trip-free circuit-breakers.

In order to satisfy the purpose of this document, requirements such as those for physical, environmental and individual items are specified in accordance with the detail requirements that are issued individually.

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# General purpose push-pull three-pole circuit-breakers for aircraft — Performance requirements

## 1 Scope

This document specifies the performance requirements for push-pull, three-pole, trip-free circuit breakers having an inverse time/current characteristic of normal ratings up to and including 35 A for use in nominal 115 V/200 V three-phase 400 Hz a.c. circuits.

## 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 2635, *Aircraft — Conductors for general purpose aircraft electrical cables and aerospace applications — Dimensions and characteristics*

ISO 1033, *Aircraft — Dimensions for general purpose push-pull three-pole circuit-breakers*

ISO 1540, *Aerospace — Characteristics of aircraft electrical systems*

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

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/

**3.1**
**push-pull three-pole circuit-breaker**
circuit-breaker with a single button to trip and reset the breaker, by pushing to make and pulling to break

**3.2**
**trip-free circuit-breaker**
Circuit-breaker so designed that holding the push-button in the closed position does not override the tripping mechanism and does not permit subsequent closure of the contacts, until the push-button has been returned to the open position and the tripping mechanism has reset

## 4 Design requirements

### 4.1 Ambient temperature and altitudes

The circuit-breaker shall be suitable for use at specified ambient temperatures and altitudes. There are two temperature ranges: −55 °C to +70 °C or −55 °C to +125 °C; and the maximum altitude according to the product standard shall not be less than 22 000 m.

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