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**Aircraft — Smart contactor — General  
requirements**

*Aéronefs — Contacteurs intelligents — Exigences générales*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://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*.

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](http://www.iso.org/members.html).

A list of all parts in the ISO 20949 series can be found on the ISO website.

## Introduction

This document provides general requirements of the smart contactor for aircraft.

Smart Contactor based power distribution systems are emerging among advanced aircraft applications, especially among More Electric Aircraft and All Electric Aircraft. Standardization is increasingly needed for Smart Contactors in aircraft power systems based on intelligent high current switching and protecting technology. Those systems have the potential for higher reliability and longer operating life, with higher capability for status sensing, over-current protection, lower maintenance costs, higher flexibility of designing power switching as well as protecting performance compared with conventional contactor switched systems.

The purpose of this document, the definitions of smart contactor and the contents of the document are as follows:

- a) The purpose of this document:
  - 1) To standardize the requirements for smart contactors that are physically and environmentally diversified.
  - 2) To provide the applicable document for various smart contactors.
- b) The definitions of smart contactor:
  - 1) Consists of an intelligent circuit and a power switch.
  - 2) Turns on/off the power output by receiving the control signal.
  - 3) Detects the over current in the load which results in shutting down for this current.
  - 4) Indicates the on/off status of the power output.
  - 5) Reports the status of smart contactor.
- c) The contents of this document:
  - 1) Definitions of the technical terms.
  - 2) Electrical requirements.
  - 3) Test methods.

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

# Aircraft — Smart contactor — General requirements

## 1 Scope

This document specifies the definitions, titles of design and general requirements and test methods to determine the performance of smart contactors for use in aircraft electrical power systems. The smart contactor consists of a switching driving circuit and a power switch for protection, action on control signals, and providing status information.

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

ISO 2678:1985, *Environmental tests for aircraft equipment — Insulation resistance and high voltage tests for electrical equipment*

ISO 7137:1995, *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 terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

### 3.1

#### **bounce time**

for a contact which is closing (opening) its circuit, the time interval between the instant when the contact circuit first closes (opens) and the instant when the circuit is finally closed (opened)

### 3.2

#### **contact bounce**

intermittent opening of contacts after initial closure due to contact impact

### 3.3

#### **control signals**

signals including control or status which is specified for operation of the smart contactor, i.e. voltage supply, control signals including turn on/off, switch status, and/or communication signals, or other

### 3.4

#### **load voltage**

voltage between the power output terminal of the smart contactor and the power ground

### 3.5

#### **off state**

condition which, with the turn-off signal applied, the device prevents power from being passed to the load