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Edition 2.0 2015-07

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Thyristor valves for high voltage direct current (HVDC) power transmission – Part 1: Electrical testing

**Valves à thyristors pour le transport d'énergie en courant continu à haute tension (CCHT) –**
**Partie 1: Essais électriques**

IEC 60700-1:2015-07(en-fr)

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# CONTENTS

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# THYRISTOR VALVES FOR HIGH VOLTAGE DIRECT CURRENT (HVDC) POWER TRANSMISSION –

## Part 1: Electrical testing

## FOREWORD

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International Standard IEC 60700-1 has been prepared by subcommittee 22F: Power electronics for electrical transmission and distribution systems, of IEC technical committee 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 1998, its Amendment 1:2003 and its Amendment 2: 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition.

a) Definitions of terms "redundant thyristor levels", "thyristor level", "valve section" have been changed for clarification.
b) The notes were added to test requirements of dielectric d.c. voltage tests for valve support, MVU, valve, specifying that before repeating the test with opposite polarity, the tested

object may be short-circuited and earthed for several hours. The same procedure may be followed at the end of the d.c. voltage test.

c) Table 1 on thyristor level faults permitted during type tests was supplemented.

d) The alternative MVU dielectric test method was added.

e) It was specified that production tests may include routine tests as well as sample tests.

f) It was added into test requirements for periodic firing and extinction tests that a scaling factor for tests shall be applied when testing with valve sections.

The text of this standard is based on the following documents:

| CDV | Report on voting |
|---|---|
| 22F/341/CDV | 22F/351A/RVC |

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60700 series, published under the general title *Thyristor valves for high voltage direct current (HVDC) power transmission*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

# THYRISTOR VALVES FOR HIGH VOLTAGE DIRECT CURRENT (HVDC) POWER TRANSMISSION –

# Part 1: Electrical testing

## 1 Scope

This part of IEC 60700 applies to thyristor valves with metal oxide surge arresters directly connected between the valve terminals, for use in a line commutated converter for high voltage d.c. power transmission or as part of a back-to-back link. It is restricted to electrical type and production tests.

The tests specified in this standard are based on air insulated valves. For other types of valves, the test requirements and acceptance criteria can be agreed.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60060, *High-voltage test techniques*

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60071-1, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60099 (all parts), *Surge arresters*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 61803:1999, *Determination of power losses in high-voltage direct current (HVDC) converter stations*
IEC 61803:1999/AMD 1:2010[1]

ISO/IEC Guide 25, *General requirements for the technical competence of testing laboratories*[2]

## 3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

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1 There exists a consolidated edition 1.1 (2011) that comprises IEC 61803:1999 and its Amendment 1:2010.

2 Withdrawn.