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High-voltage switchgear and controlgear – Gas-filled wrought aluminium and aluminium alloy enclosures

bsi.

National foreword

This British Standard is the UK implementation of EN 50064:2018. It supersedes BS 7315:1990+A1:1993, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PEL/17, High voltage switchgear, controlgear and assemblies.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Appareillage électrique haute tension - Enveloppes sous pression en aluminium corroyé et en alliage d'aluminium

Hochspannungs-Schaltgeräte und Schaltanlagen - Gasgefüllte Kapselungen aus Aluminium und Aluminium-Knetlegierungen

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European foreword

This document (EN 50064:2018) has been prepared by CLC/TC 17AC, "*High-voltage switchgear and controlgear*".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2019-08-27
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2021-08-27

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

This document supersedes EN 50064:1989.

This European Standard has been revised by CENELEC Technical Committee 17AC High-voltage switchgear and controlgear. It supplements the relevant product standards on gas-insulated switchgear and controlgear in that it provides specific requirements for pressurized high-voltage switchgear and controlgear.

The present EN has been written to get a European specification for the design, construction, testing, inspection and certification of pressurized enclosures used in high-voltage switchgear and controlgear.

In this respect this European Standard constitutes the exclusion of HV switchgear from the scope of the Directive 2014/68/EU (superseding 97/23/EC) concerning pressure equipment. Article 1, 2. (l) excludes "enclosures for high-voltage electrical equipment such as switchgear, controlgear, transformers, and rotating machines" from the scope of the Directive.

This standard deals with gas-insulated switchgear enclosures of wrought aluminium and aluminium alloy and their welding. For different enclosure materials, other European Standards are available.

Introduction

This standard covers the requirements for the design, construction, testing, inspection and certification of gas-filled enclosures for use specifically in high-voltage switchgear and controlgear, or for associated gas-filled equipment.

Special consideration is given to these enclosures for the following reasons.

(a) The enclosures usually form the containment of electrical equipment, thus their shape is determined by electrical rather than mechanical requirements.

(b) The enclosures are installed in restricted access areas and the equipment is operated by instructed, authorized persons only.

(c) As the thorough drying of the inert, non-corrosive gas-filling medium is fundamental to the satisfactory operation of the electrical equipment, the gas is periodically checked. For this reason, no internal corrosion allowance is required on the wall thickness of these enclosures.

(d) The enclosures are subjected to only small fluctuations of pressure as the gas-filling density will be maintained within close limits to ensure satisfactory insulating and arc-quenching properties. Therefore, the enclosures are not liable to fatigue due to pressure cycling.

(e) The operating pressure is relatively low.

Due to the foregoing reasons and to ensure maximum service continuity as well as to reduce the risk of moisture and dust entering the enclosures which may endanger safe electrical operation of the switchgear, no pressure tests should be carried out after installation and before placing in service and no periodic inspection of the enclosure interiors or pressure tests should be carried out after the equipment is placed in service.

1 Scope

This document applies to wrought aluminium and aluminium alloy enclosures and their welding. These enclosures are pressurized with dry air, inert gases, for example sulphur hexafluoride or nitrogen or a mixture of such gases, used in indoor and outdoor installations of high-voltage switchgear and controlgear with rated voltages above 1 kV, where the gas is used principally for its dielectric and/or arc-quenching properties with rated voltages.

— above 1 kV and up to and including 52 kV concerning gas-filled compartments with design pressure higher than 300 kPa relative pressure (gauge);

— above 52 kV concerning all gas-filled compartments.

The enclosures comprise parts of electrical equipment not necessarily limited to the following examples:

— circuit-breakers;

— switch-disconnectors;

— disconnectors;

— earthing switches;

— current transformers;

— voltage transformers;

— surge arrestors;

— busbars and connections;

— etc.

The scope also covers enclosures of pressurized components such as the centre chamber of live tank switchgear, gas-insulated current transformers, etc.

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.

EN 13445-3, *Unfired pressure vessels — Part 3: Design*

EN 13445-8:2014, *Unfired pressure vessels — Part 8: Additional requirements for pressure vessels of aluminium and aluminium alloys*

EN 62271-1:2017, *High-voltage switchgear and controlgear — Part 1: Common specifications for alternating current switchgear and controlgear (IEC 62271-1:2017)*

EN ISO 3452 (all parts), *Non-destructive testing — Penetrant testing (ISO 3452)*

EN ISO 898 (all parts), *Mechanical properties of fasteners made of carbon steel and alloy steel (ISO 898)*

EN ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2)*

EN ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712)*