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Aerospace series - Circuit breakers - Test methods - Part 404: Explosion proofness

Luft- und Raumfahrt - Schutzschalter - Prüfverfahren - Teil 404: Explosionsdichtheit

Série aérospatiale - Disjoncteurs - Méthodes d'essais - Partie 404 : Antidéflagration

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Aerospace series - Circuit breakers - Test methods - Part 404: Explosion proofness

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This European Standard was approved by CEN on 10 September 2004.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 3841-404:2004) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-STAN).

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

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

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

1 Scope

This standard specifies a method of verifying explosion proofness of circuit breakers.

It shall be used together with EN 3841-100.

2 Normative references

The following referenced documents are indispensable for the application 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 7137, *Aircraft – Environmental conditions and test procedures for airborne equipment*

EN 3841-100, *Aerospace series – Circuit breakers – Test methods – Part 100: General*

3 Method

3.1 Test mounting

3.1.1 General

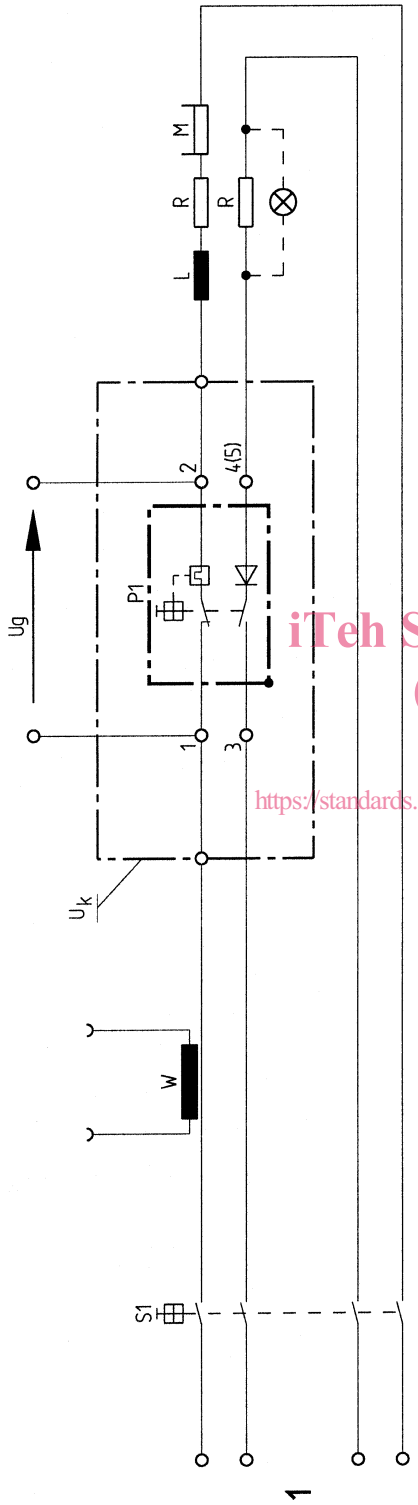
The circuit breakers shall be mounted approximately in the centre of the chamber, and as specified in EN 3841-100, in connection with the applicable product standard. The chamber volume (≥ 25 l) shall ensure that the circuit breakers are evenly exposed to the explosive mixture. The test chamber shall be fitted with a spark plug which allows the combustibility of the mixture to be verified when the chamber is closed.

The test chamber shall provide a facility to switch on the circuit breakers when the chamber is closed (for manual or remote operation).

3.1.2 Test circuit

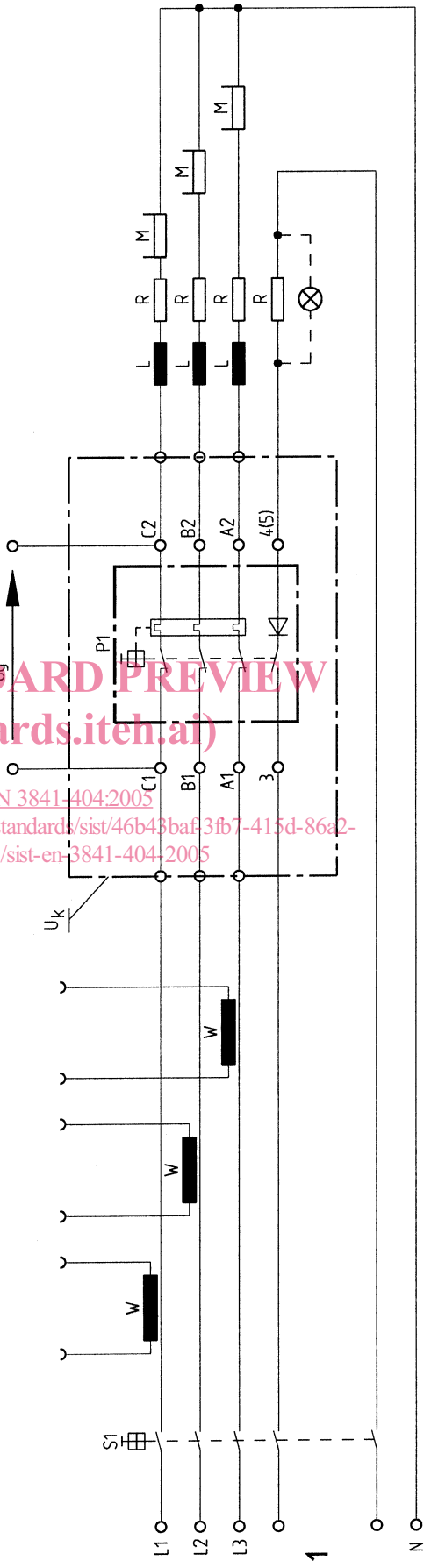
According to Figure 1 with d.c. and a.c., single-pole.

According to Figure 2 with a.c., three-pole.



Key
1 d.c.; a.c.

Figure 1



Key
1 d.c.; a.c.

Figure 2

Where **S1** : main switch
L : inductance
R : loading resistor
W or **M** : converter or shunt for current measurement
P1 : test specimen (circuit breaker)
U_g : voltage at circuit breakers' terminals
U_k : test chamber (for explosion proofness)
L1, **L2**, **L3** : a.c. phases
N: neutral

3.1.3 Test mixture

Gas mixture of air and fuel vapour (grade of fuel 100/130 octane gasoline or propane or standard hexane, with a volumetric ratio of 13:1) following ISO 7137.

3.1.4 Test temperature

The test temperature shall be 70 °C.

3.1.5 Pressure in the test chamber

The pressure in the test chamber shall be atmospheric pressure at normal altitude.

3.2 Procedure

The test chamber shall be heated to the temperature and filled with the explosive mixture. (the explosive mixture may also be produced by injecting the fuel quantity proportionate to the chamber volume, provided that an adequate mixing and even distribution of the mixture are ensured).

The circuit breakers shall be stored in the explosive atmosphere for 3 h prior to break operations. The operations as outlined in the product standard shall be carried out at intervals of 1 h. The mixture shall remain explosive during this period.

3.3 Requirement

The explosive mixture shall not ignite when the circuit breakers are operated. On completion of the operations, combustibility of the mixture shall be verified by means of the spark plug. If the mixture does not ignite, the test shall be repeated with new test samples.