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Aerospace series - Circuit breakers - Test methods - Part 306: Service life

Luft- und Raumfahrt - Schutzschalter - Prüfverfahren - Teil 306: Lebensdauer

Série aérospatiale - Disjoncteurs - Méthodes d'essais - Partie 306 : Durée de vie

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Aerospace series - Circuit breakers - Test methods - Part 306: Service life

Série aérospatiale - Disjoncteurs - Méthodes d'essais - Partie 306 : Durée de vie

Luft- und Raumfahrt - Schutzschalter - Prüfverfahren - Teil 306: Lebensdauer

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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Contents

Page

Foreword

This document (EN 3841-306:2004) 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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.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 the service life 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.

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

3 Method

3.1 General conditions

The circuit breakers shall be mounted as specified in EN 3841-100, in connection with the applicable technical specification and the product standard.

The adjustment of the test current shall be carried out with ohmic resistors and ironless inductors.

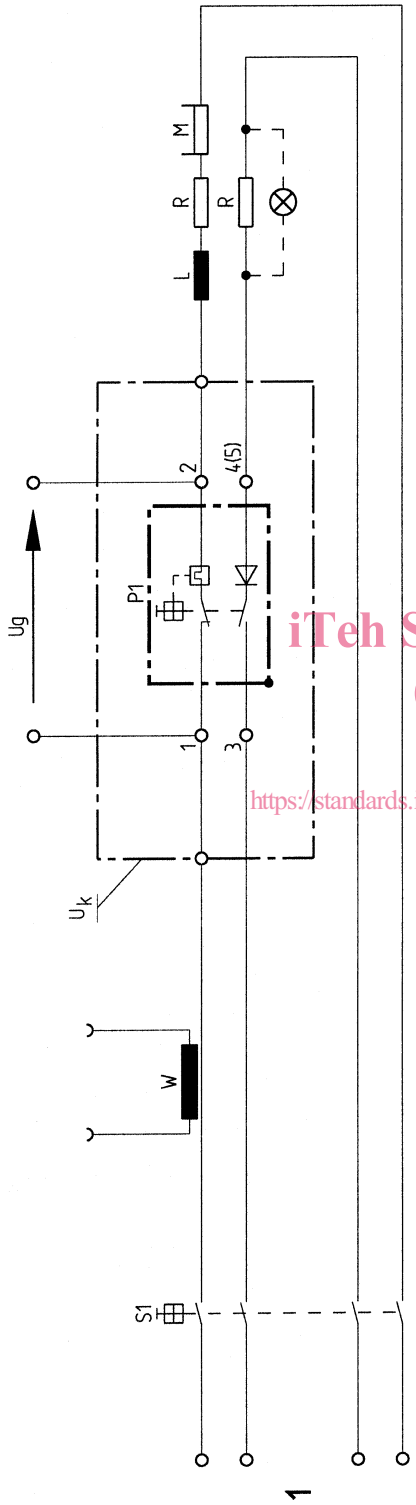
NOTE If iron-core inductors are used, saturation shall not occur until the peak of the test current has been reached.

The resistors and inductors shall be connected in series. The inductance of the current source shall be taken into account when determining the time constant and the power factor.

3.2 Test circuit

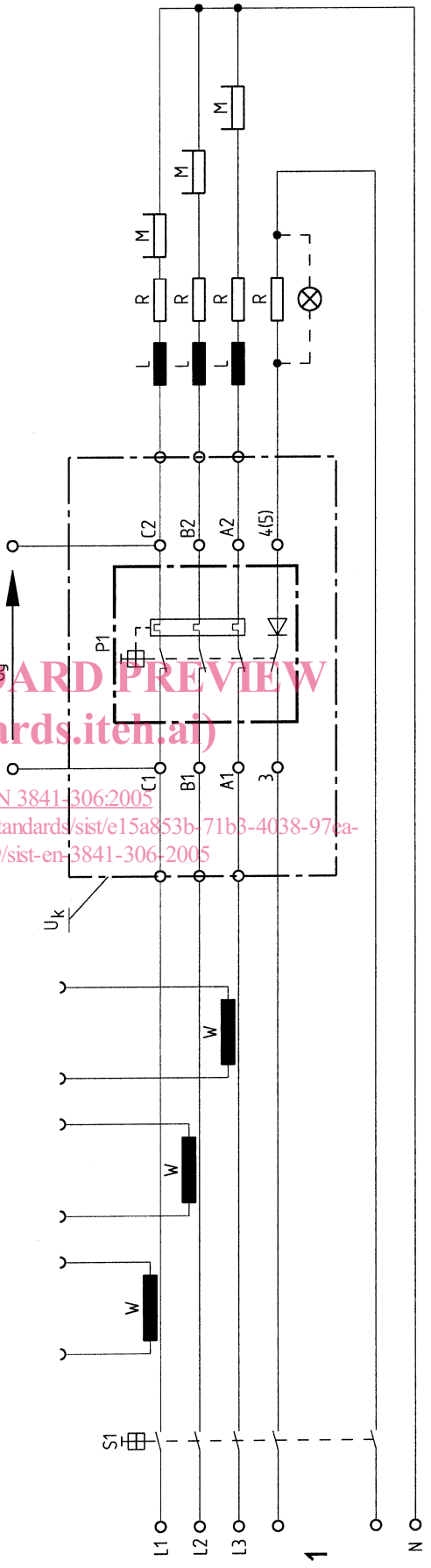
According to Figure 1 with d.c. and a.c., single-pole.

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

3.3 Operations

One operating cycle is defined as one closing and then one opening of the circuit breakers. The circuit breakers may be operated either manually or by means of a mechanical device simulating the manual operation as much as possible.

The test shall be carried out with two operating cycles per minute (electrical tests) or six or seven operating cycles per minute (mechanical tests) at an actuating speed of 12 mm/s, with a duty cycle of 20 %.

3.4 Service life without load

The number of operating cycles shall be specified in the product standard.

Verification tests in accordance with technical specification and product standard.

3.5 Service life at rated current

The number of operating cycles and the applicable load values shall be specified in the product standard.

The load of the signal contacts related to the load of the main contacts shall also be indicated in the product standard.

Verification tests in accordance with technical specification and product standard.

3.6 Service life at low current

The number of operating cycles shall be specified in the product standard.

Verification tests in accordance with technical specification and product standard.

3.7 Service life with overload tripping

3.7.1 General

The number of operating cycles and the applicable load values shall be specified in the product standard.

3.7.2 Operations

3.7.2.1 Break operation (CO)

The circuit breakers shall be switched on without current. Then the overload shall be switched an to the circuit breakers by means of the main switch (S1) and maintained until the circuit breakers trip.

3.7.2.2 Make operation (OCO)

The main switch (S1) shall be closed and the circuit breakers shall be switched on. Then the actuator button shall be released at normal operating speed. Switch off is by overload tripping.

3.7.2.3 Operating conditions

When multi-pole circuit breakers are tested for single-pole overload tripping, the remaining poles shall carry 0,9 *I*n. The number of operating cycles and the switching sequence shall be indicated in the product standard.

3.7.3 Verification tests

In accordance with technical specification and product standard

3.8 Test combinations

The product standard may specify test combinations according to 3.4, 3.5, 3.6 and 3.7 in a defined sequence.