



SLOVENSKI STANDARD
SIST EN 3773-001:2002
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Aerospace series - Circuit breakers, single-pole, temperature compensated, rated currents 1 A to 25 A, switching capacity 65 /n/1000 A max. - Part 001: Technical specification

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Luft- und Raumfahrt - Schutzschalter, einpolig, temperaturkompensiert, Nennströme von 1 A bis 25 A, Schaltvermögen 65 /n/1000 A max. - Teil 001: Technische Lieferbedingungen

[SIST EN 3773-001:2002](https://standards.iteh.ai/catalog/standards/sist/47a4cc98-becc-4ba5-9d96-3773-001)

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Série aérospatiale - Disjoncteurs unipolaires compensés en température, intensités nominales 1 A a 25 A, pouvoir de coupure 65 /n/1000 A max. - Partie 001: Spécification technique

Ta slovenski standard je istoveten z: EN 3773-001:1999

ICS:

49.060 Štejni sistemski inženiring in oprema za letalstvo in vesolje Aerospace electric equipment and systems

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 3773-001

June 1999

ICS 49.060

English version

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This European Standard was approved by CEN on 4 September 1998.

CEN members are bound to comply with the CEN/GENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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.

<https://standards.iteh.ai/catalog/standards/sist/47a4cc98-becc-4ba5-9d96->

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries 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 December 1999, and conflicting national standards shall be withdrawn at the latest by December 1999.

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

1 Scope

This standard specifies the required characteristics for single-pole, temperature compensated circuit breakers, rated currents from 1 A to 25 A, switching capacity $65 I_n/1\ 000$ A max., for use in aircraft electrical systems, at temperatures between -55 °C and 125 °C and at a maximum altitude of $Z = 22\ 000$ m.

It shall be used together with EN 2350.

These circuit breakers are intended for use in aircraft with electrical supplies in accordance with EN 2282.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

| | |
|---------|--|
| EN 2282 | Aerospace series - Characteristics of aircraft electrical supplies |
| EN 2350 | Aerospace series - Circuit breakers - Technical specification |
| EN 3042 | Aerospace series - Quality assurance - EN aerospace products - Qualification procedure |

3 Definitions iTeh STANDARD PREVIEW

For the purposes of this standard, the definitions given in EN 2350 apply.

4 Description

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These circuit breakers are operated by a push-pull actuator button with trip-free release and delayed tripping; they are explosion-proof. Their operation is ensured up to the short-circuit current.

5 Required characteristics

Rated currents (I_n) and voltages

See tables 1 and 2.

Table 1 - Rated currents

| | | | | | | | | | | |
|-------------------------------|-----|-----|-----------------|-----|--------|-----------------|-----|------|-----|-----|
| Rated currents (I_n) A | 1 | 2 | 2,5 | 3 | 5 | 7,5 | 10 | 15 | 20 | 25 |
| Code | 01A | 02A | 2A5 | 03A | 05A | 7A5 | 10A | 15A | 20A | 25A |
| Range | Low | | | | Medium | | | High | | |
| Button marking | 1 | 2 | 2 $\frac{1}{2}$ | 3 | 5 | 7 $\frac{1}{2}$ | 10 | 15 | 20 | 25 |

Table 2 - Rated voltages

| | |
|---------------|--|
| Rated voltage | 28 V d.c. 26 V a.c., 400 Hz, single phase 115 V a.c., 400 Hz, single phase |
|---------------|--|

6 Tests

6.1 Mechanical tests

See table 3 and EN 2350.

Table 3 - Mechanical characteristics

| Characteristics | | | Requirements | |
|--------------------------|------------------------|------------------------|-----------------------|-------------|
| Visual inspection | | | EN 2350 | |
| Dimensions and mass | | | EN 2350 | |
| Actuator button travel | | | EN 2350 | |
| Operating force | | Closing force | 3,5 N to 45 N | |
| | | Opening force | 5 N to 30 N | |
| Mechanical strength | Actuator button | Transverse load | | 110 N min. |
| | | Longitudinal load | Push direction | 110 N min. |
| | | | Pull direction | 110 N min. |
| | Mounting | Tightening torque | | 5 Nm min. |
| | | Rotational torque | | 3 Nm min. |
| | Electrical connections | Tightening torque | | 1,7 Nm min. |
| | | Pull force along F1 1) | | 110 N min. |
| | | Push force along F2 1) | | 55 N min. |
| 1) See product standard. | | | SIST EN 3773-001:2002 | |

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6.2 Environmental tests

See table 4 and EN 2350.

Table 4 - Environmental conditions

| Characteristics | Requirements |
|---|---|
| Vibration 1) | 5 Hz to 57 Hz, constant amplitude 2 a = 0,76 mm |
| | 57 Hz to 350 Hz, constant acceleration 49 m/s ² ($\approx 5 g_n$) |
| | 350 Hz to 500 Hz, constant amplitude 2 a = 0,02 mm |
| | 500 Hz to 2 000 Hz, constant acceleration 98,1 m/s ² ($\approx 10 g_n$) |
| Mechanical shock 1) | 245,25 m/s ² ($\approx 25 g_n$) |
| Centrifugal acceleration 1) | 166,8 m/s ² ($\approx 17 g_n$) |
| Sand and dust | See EN 2350. |
| Corrosion | See EN 2350. |
| Humidity | See EN 2350. Category B: 10 cycles |
| Explosion proofness | Short-circuit current, see product standard. |
| Fluid contamination | See EN 2350. |
| 1) Tightening torques for these tests: - electrical connections: 1,5 Nm to 1,7 Nm - mounting: 3 Nm to 5 Nm. | |

6.3 Electrical tests

See tables 5 to 12 and EN 2350.

Table 5 - Electrical characteristics

| Characteristics | | Requirements | |
|---|--|--|----------------|
| Voltage drop | | See table 6. | |
| Insulation resistance | | 100 M Ω min. | |
| Dielectric strength | 1 500 V on ground $t = (23 \pm 5) ^\circ\text{C}$ $t = (-55 \pm 5) ^\circ\text{C}$ 1) $t = (125 \pm 5) ^\circ\text{C}$ 1) | Leakage current ≤ 1 mA No flashover, no damage | |
| | 400 V at 22 000 m $t = (23 \pm 5) ^\circ\text{C}$ | | |
| Minimum and maximum tripping points | | See table 7. | |
| Overload tripping times | | See table 8. | |
| Trip-free release | | See table 8. At 23 $^\circ\text{C}$ and 200 % of I_n only. | |
| Minimum tripping points at maximum altitude of 22 000 m (40 hPa) | | No tripping | |
| Ambient temperature $^\circ\text{C}$ | - 55 | | 105 % of I_n |
| | 23 | | 105 % of I_n |
| | 125 | | 80 % of I_n |
| Short-circuit performance | | See table 9. | |
| Service life at no load and at rated current | | See table 10. | |
| Service life under overload trip conditions | | See table 11. | |
| Overload test with mechanism locked | | See table 12. | |
| 1) Where applicable | | | |

Table 6 - Voltage drop

| Rated current A | 1 | 2 | 2,5 | 3 | 5 | 7,5 | 10 | 15 | 20 | 25 |
|---|------|------|------|------|------|------|------|------|------|------|
| Maximum voltage drop at rated current V | 1,10 | 0,80 | 0,75 | 0,55 | 0,35 | 0,30 | 0,30 | 0,25 | 0,25 | 0,20 |
| Maximum voltage drop at minimum current 100 mA mV | 100 | 40 | 30 | 18 | 8 | 4 | 2,5 | 2,5 | 2,5 | 2,5 |

Table 7 - Minimum and maximum tripping points

| Rated current A | Temperature $\pm 5 ^\circ\text{C}$ | Load as % of I_n | |
|--------------------|---------------------------------------|--------------------------------|-----------------------------------|
| | | Min. tripping point > 1 h | Max. tripping point ≤ 1 h |
| 1 to 25 | 23 | 115 | 140 |
| | - 55 | 115 | 160 |
| | 125 | 100 | 140 |
| | 70 | 105 | 140 |

Table 8 - Overload tripping times

| Temperature $\pm 5\text{ }^\circ\text{C}$ | Overload as % of rated current | | |
|--|--------------------------------|-------------------|--------------------|
| | 200 | 500 | 1 000 |
| | Tripping times in seconds | | |
| 23 | 1,5 to 20 | 0,15 to 2,5 | 0,035 to 0,6 |
| - 55 | 2 to 30 | | |
| 125 | 1,5 to 20 | | |

Table 9 - Short-circuit performance

| | | | | |
|---|--------------------------------|----------|-----------------------------|----------|
| Rated voltage | 28 V d.c. | | 115 V a.c. 400 Hz | |
| No load voltage | (30 \pm 2) V | | (120 \pm 5) V a.c., 400Hz | |
| Short-circuit current establishment time | 2 ms to 10 ms | | 2 ms to 5 ms | |
| Test current | Product standard L/R < 1 ms | | Product standard | |
| Test altitude | Sea level | 22 000 m | Sea level | 22 000 m |
| Number of specimens per range | 1 | 1 | 1 | 1 |
| Number of tests | CO 1) OCO 1) | 2) | 2) | 2) |
| 1) See EN 2350. SIST EN 3773-001:2002 | | | | |
| 2) See product standards.iteh.ai/catalog/standards/sist/47a4cc98-becc-4ba5-9d96-5b5a325aa09/sist-en-3773-001-2002 | | | | |

Table 10 - Service life at no load and at rated current

| Circuit characteristics | No load | 28 V d.c. at: | | 115 V a.c. to 200 V a.c., 400 Hz I_n inductive $0,6 \leq \cos \varphi \leq 0,7$ (M) 1) |
|--|------------------------|---------------------------|---|--|
| | | I_n resistive (M) 1) | I_n inductive L/R = 5 ms (M) 1) | |
| Number of cycles | $I_n \leq 10\text{ A}$ | 5 000 | 2 500 up to $I_n \leq 3\text{ A}$ | 5 000 |
| | $I_n > 10\text{ A}$ | 5 000 | – | 2 500 |
| 1) Tests marked (M) shall be preceded by a no-load mechanical life test. NOTE: Tolerance for voltage, current and frequency values: $\pm 5\%$ | | | | |

Table 11 - Service life under overload trip conditions

| Rated voltage | Overload | Test conditions | |
|------------------------------------|---|---|--|
| | | Sea level $t = (23 \pm 5)\text{ }^\circ\text{C}$ | Z = 22 000 m $t = (23 \pm 5)\text{ }^\circ\text{C}$ |
| (28 \pm 1,4) V d.c. | $I = 5 I_n$ L/R = 5 ms | 15 CO 1) 15 OCO 1) | 20 CO 1) |
| (115 \pm 5,75) V a.c., 400 Hz | $I = 5 I_n$ $0,6 \leq \cos \varphi \leq 0,7$ | 15 CO 1) 15 OCO 1) | 20 CO 1) |
| 1) See EN 2350. | | | |