



SLOVENSKI STANDARD
SIST EN 2665-001:2002
01-januar-2002

Aerospace series - Circuit breakers, three-pole, temperature compensated, rated currents 20 A to 50 A - Part 001: Technical specification

Aerospace series - Circuit breakers, three-pole, temperature compensated, rated currents 20 A to 50 A - Part 001: Technical specification

Luft- und Raumfahrt - Schutzschalter, dreipolig, temperaturkompensiert, Nennströme von 20 A bis 50 A - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Disjoncteurs tripolaires compensés en température, intensités nominales 20 A à 50 A - Partie 001: Spécification technique

<https://standards.iteh.ai/catalog/standards/sist/ab3c5874-ee6d-4206-a354-02b9d853e600/sist-en-2665-001-2002>

Ta slovenski standard je istoveten z: EN 2665-001:1999

ICS:

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

SIST EN 2665-001:2002

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 2665-001:2002

<https://standards.iteh.ai/catalog/standards/sist/ab3c5874-ee6d-4206-a354-02b9d853e600/sist-en-2665-001-2002>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 2665-001

June 1999

ICS 49.060

English version

Aerospace series - Circuit breakers, three-pole, temperature compensated, rated currents 20 A to 50 A - Part 001: Technical specification

Série aérospatiale - Disjoncteurs tripolaires compensés en température, intensités nominales 20 A à 50 A - Partie 001: Spécification technique

Luft- und Raumfahrt - Schutzschalter, dreipolig, temperaturkompensiert, Nennströme von 20 A bis 50 A - Teil 001: Technische Lieferbedingungen

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

CEN members are bound to comply with the CEN/CENELEC 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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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 three-pole, temperature compensated circuit breakers, rated currents from 20 A to 50 A, for use in aircraft electrical systems, at temperatures between – 55 °C and 90 °C and at a maximum altitude of $Z = 15\,000$ 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 - EN aerospace products - Qualification procedure

3 Definitions

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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

[SIST EN 2665-001:2002](https://standards.iteh.ai/catalog/standards/sist/ab3c5874-cefd-4206-a354-02b9d853e600/sist-en-2665-001-2002)

4 Description

<https://standards.iteh.ai/catalog/standards/sist/ab3c5874-cefd-4206-a354-02b9d853e600/sist-en-2665-001-2002>

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	20	25	30	35	40	45	50
Code	20 A	25 A	30 A	35 A	40 A	45 A	50 A
Range	Low			Medium		High	
Button marking	20	25	30	35	40	45	50

Table 2 - Rated voltages

Rated voltage	115/200 V a.c., 400 Hz, three-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	20 N to 80 N	
		Opening force	5 N to 45 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	
	Rotational torque		4 Nm min.	
	Electrical connections	Tightening torque		2,5 Nm min.
		Pull force along F1 ¹⁾ Push force along F2 ¹⁾		185 N min. 90 N min.
	1) See product standard.			

SIST EN 2665-001:2002

<https://standards.itech.ai/catalog/standards/sist/ab3c5874-ee6d-4206-a354-02b9d853e600/sist-en-2665-001-2002>

6.2 Environmental tests

See table 4 and EN 2350.

Table 4 - Environmental conditions

Characteristics	Requirements
Vibration ¹⁾	5 Hz to 54 Hz, constant amplitude 2 a = 0,51 mm
	54 Hz to 2 000 Hz, constant acceleration 29,43 m/s ² ($\approx 3 g_n$)
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 Voltage 115/200 V a.c., 400 Hz, three-pole load
Fluid contamination	See EN 2350.
1) Tightening torques for these tests: - electrical connections: 2,2 Nm to 2,5 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 at rated current		See table 6.
Voltage drop at low current		Not applicable
Insulation resistance		100 M Ω min.
Dielectric strength	1 500 V on ground $t = (23 \pm 5) ^\circ\text{C}$ $t = (-55 \pm 5) ^\circ\text{C}$ $t = (90 \pm 5) ^\circ\text{C}$	Leakage current ≤ 1 mA No flashover, no damage
	400 V at 15 000 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 15 000 m (121 hPa)		No tripping
Ambient temperature $^\circ\text{C}$	55 105 % of I_n	
	23 105 % of I_n	
	90 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.

Table 6 - Voltage drop at rated current

Rated current A	20	25	30	35	40	45	50
Maximum voltage drop V	0,15				0,12		

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 \leq 1 h
20 to 50	23	110	145
	- 55	110	165
	70	105	145
	90	100	145

For detection of the minimum tripping point, the load shall be identical on all poles.

For detection of the maximum tripping point, the load shall be increased:

- by 20 % when one pole is loaded and the others are not loaded;
- by 10 % when two poles are loaded and the third is not loaded.

Table 8 - Overload tripping times

Temperature $\pm 5\text{ }^{\circ}\text{C}$	Overload as % of rated current					
	200		500		1 000	
	Three poles	One pole	Three poles	One pole	Three poles	One pole
Tripping times in seconds						
23	2 to 18	2 to 22	0,15 to 3,5	0,15 to 5,2	0,06 to 0,85	0,06 to 1,3
- 55	3 to 60	3 to 110				
90	1,5 to 17	1,5 to 22				

Perform the test on the three poles in series.

When testing one pole, the others shall not be loaded.

Table 9 - Short-circuit performance

Rated voltage	115/200 V a.c., 400 Hz		
No load voltage	(120/208 \pm 5) V a.c., 400 Hz		
Short-circuit current establishment time	2 ms to 5 ms		
Test circuit	<p>The diagram illustrates a three-phase test circuit. Each phase (L1, L2, L3) is connected to a switch (A1, B1, C1) and a second switch (A2, B2, C2). The switches are connected to a fuse and a short-circuiting device. A 0,1A fuse is connected to the Earth line.</p>		
Test current	See product standard.		
Test altitude	Sea level		15 000 m
Number of specimens per range	One pole	Three poles	Three poles
	3 1)	See EN 2350, group 13	See EN 2350, group 14
Number of tests	CO 2) OCO 2)	3)	3)
1) Taken from groups 6, 15 and 16 2) See EN 2350. 3) See product standard.			

Test on one pole

For each specimen, one pole shall be subjected to test current, the others to I_n . Each of the three poles shall be tested on all specimens.