BS EN 2665-004:2013

BSI Standards Publication

Aerospace series — Circuit breakers, three-pole, temperature compensated, rated current 20 A to 50 A

Part 004: UNC thread terminals — Product standard

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 2665-004:2013. It supersedes BS EN 2665-004:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

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.

ISBN 978 0 580 83444 8

ICS 49.060

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2013.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 2665-004

December 2013

ICS 49.060

English Version

Aerospace series - Circuit breakers, three-pole, temperature compensated, rated current 20 A to 50 A - Part 004: UNC thread terminals - Product standard

Série aérospatiale - Disjoncteurs tripolaires compensés en température, intensités nominales 20 A à 50 A - Partie 004 : Bornes à filetage UNC - Norme de produit

Luft- und Raumfahrt - Schutzschalter, dreipolig, temperaturkompensiert, Nennströme von 20 A bis 50 A - Teil 004: UNC-Klemmengewinde - Produktnorm

This European Standard was approved by CEN on 28 September 2013.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword **3**
1 Scope **4**
2 Normative references **4**
3 Terms and definitions **4**
4 Dimensions and mass **4**
5 Characteristics **6**
6 Designation **11**
7 Rated current code **11**
8 Delivery codes **11**
9 Marking **12**
10 Technical specification **12**

Foreword

This document (EN 2665-004:2013) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-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 ASD, 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 2014, and conflicting national standards shall be withdrawn at the latest by June 2014.

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

This document supersedes EN 2665-004:1999.

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

1 Scope

This European Standard specifies the characteristics of three-pole circuit breakers, temperature compensated with a rated current from 20 A to 50 A, used in aircraft on-board circuits at a temperature between – 55 °C and 90 °C at an altitude of 15 000 m max.

These circuit breakers are operated by a push-pull type single pushbutton (actuator), with delayed action "trip-free" tripping

They will continue to function up to the short-circuit current.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2350, *Aerospace series — Circuit breakers — Technical specification*

EN 2665-001, *Aerospace series — Circuit breakers, three-pole, temperature compensated, rated currents 20 A to 50 A — Part 001: Technical specification*

EN 3841-305, *Aerospace series — Circuit breakers — Test methods — Part 305: Short-circuit performance*

EN 6113, *Aerospace series — Circuit breaker, connecting and attachment hardware* [1)]

TR 6083, *Aerospace series — Cut-outs for installation of electrical components* [2)]

FED-STD-595B, *Colors used in Government Procurement* [3)]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 2350 apply.

4 Dimensions and mass

4.1 Dimensional characteristics

The circuit breakers do not have to correspond to the pictorial illustration, only the dimensions given shall be adhered to.

Dimensions are in millimetres with exception terminal thread 8-32 UNC.

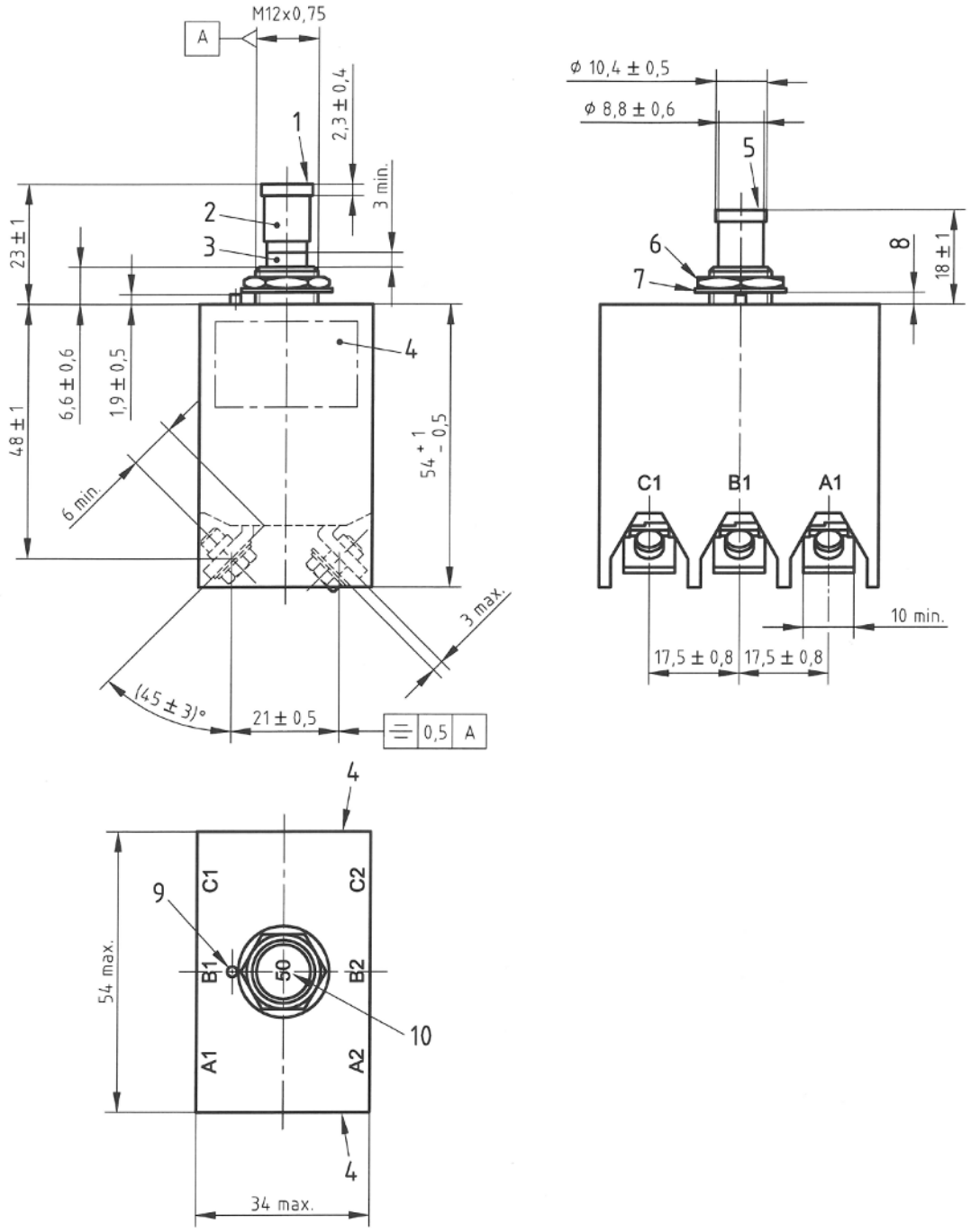
See Figure 1.

---

1) Published as ASD-STAN Prestandard at the date of publication of this standard. http://www.asd-stan.org/

2) Published as ASD-STAN Technical Report at the date of publication of this standard. http://www.asd-stan.org/

3) Published by: DoD National (US) Mil. Department of Defense http://www.defenselink.mil/



Key

1 Push button released
2 Black colour according to FED-STD-595B
3 White
4 Marking, see Clause 6.
5 Push button pressed
6 Attachment nut
7 Lock washer
8 1,0 max. to 3,0 max.
9 Positioning lug in accordance with the panel cut-out, as per TR 6083C202
10 Rated current marking (white on black)

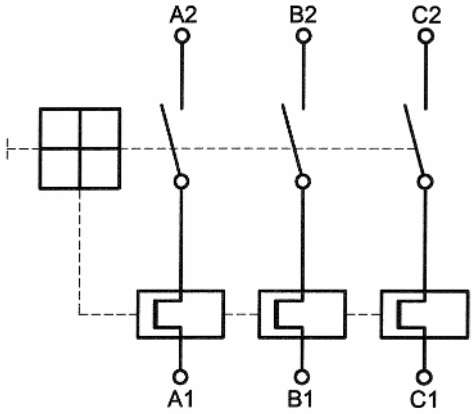
Figure 1 — Configuration – Dimensions – Tolerances

4.2 Electrical diagram

See Figure 2.

Push button released: CB open.

Push button pressed: CB closed.



Key

1 Load
2 Supply

Load and supply can be inverted.

Figure 2 — Electrical diagram

4.3 Mass

162 g max. (delivery code A including hardware).

4.4 Panel mounting

See EN 2665-001.

5 Characteristics

5.1 Material, surface treatment

See EN 2665-001.

5.2 Mechanical characteristics

5.2.1 Fasteners

See EN 6113.

5.2.2 Recommended tightening torque of attaching nut for installation

(5,25 ± 0,25) Nm

5.2.3 Recommended tightening torque of connection hardware for installation

(2,35 ± 0,15) Nm

5.2.4 Resistance to vibrations

5.2.4.1 Combined test: ambient temperature at 70 °C and vibrations

Sinusoidal : 10 g_n, see EN 2665-001.

Random : 5,8 g_n, see EN 2665-001.

Low frequencies : 10 g_n, see EN 2665-001.

5.2.4.2 Combined test: ambient temperature at 85 °C, altitude and vibrations

Sinusoidal: 3 g_n, see EN 2665-001.

5.2.5 Resistance to shocks

50 g_n, see EN 2665-001.

5.2.6 Mechanical endurance

See Table 6.

5.3 Environment characteristics

5.3.1 Humidity

See EN 2665-001.

5.3.2 Corrosion

See EN 2665-001.

5.3.3 Contaminating liquids

See EN 2665-001.

5.3.4 Overvoltage caused by lightning

See EN 2665-001.

5.4 Electrical characteristics

5.4.1 Nominal voltage of operational circuits

See Table 1.

Table 1

Nominal voltage	115/200 V a.c., 360 Hz – 800 Hz, three phase

5.4.2 Voltage drop at I_n

See Table 2.

Table 2

Ratings A	20	25	30	35	40	45	50
U max. at I_n V	0,15	0,15	0,15	0,15	0,12	0,12	0,12

5.4.3 Minimum and maximum tripping thresholds

See Table 3.

Table 3

		Overload (in % of I_n)		
Ambient temperatures	**Ratings**	**Minimum thresholds value** > 1 h		**Maximum thresholds value** < 1 h
°C	A	On ground	At 15 000 m	On ground
23 ± 5	All	110	105	145
− 55 ± 5		110	105	165
70 ± 5		105	100	145
90 ± 5		100	90	145

NOTE 1 For detection of minimum threshold, all the poles are connected in series.

NOTE 2 For detection of maximum threshold, load value is:

- increased by about 20 % when one pole is submitted to the load and other poles are not loaded;
- increased by about 10 % when two poles are submitted to the load and the other one is not loaded;
- not increased when the two other poles are loaded at 0,9 I_n.

5.4.4 Overload trip

See Table 4.

Table 4

		Overload (in % of I_n)					
		200		**500**		**1 000**	
		3 poles	**1 pole**	**3 poles**	**1 pole**	**3 poles**	**1 pole**
Ambient temperatures °C	**Ratings** A	**Trip time** s					
23 ± 5	All	2 to 20	2 to 22	0,15 to 4,00	0,15 to 5,20	0,05 to 1,00	0,06 to 1,30
− 55 ± 5		≤ 60	≤ 110				
90 ± 5		≥ 1,5	≥ 1,5				
NOTE 1 When 3 poles are loaded, they will be connected in series. NOTE 2 When 1 pole is loaded, the two other poles are not loaded.							

5.4.5 Short-circuit values

See Table 5.

Table 5

Nominal voltage	115/200 V a.c., 360 Hz to 800 Hz
Prospective currents	$0,8 \leq \cos \varphi \leq 1$
	2 000 A r.m.s.
Test altitudes	On the ground and at maximum altitude (15 000 m, 12 100 Pa)
Number of operations	1 CO [a] + 2 OCO [b]
[a] Break operation (for definition refer to EN 3841-305). [b] Make operation (for definition refer to EN 3841-305).	

5.4.6 No-load and load endurance

See Table 6.

Table 6

		Number of operations to be provided	
		No-load	Load
		5 000	2 500
All ratings	**Main contacts**	Applicable	Inductive $0,6 \leq \cos \varphi \leq 0,7$ I_n, 115/200 V a.c. - 360 Hz to 800 Hz
NOTE 1 One operation corresponds to one closing + one opening.			
NOTE 2 Tolerances ± 5 % on current, voltage and frequency values.			

5.4.7 Dielectric rigidity

See Table 7.

Table 7

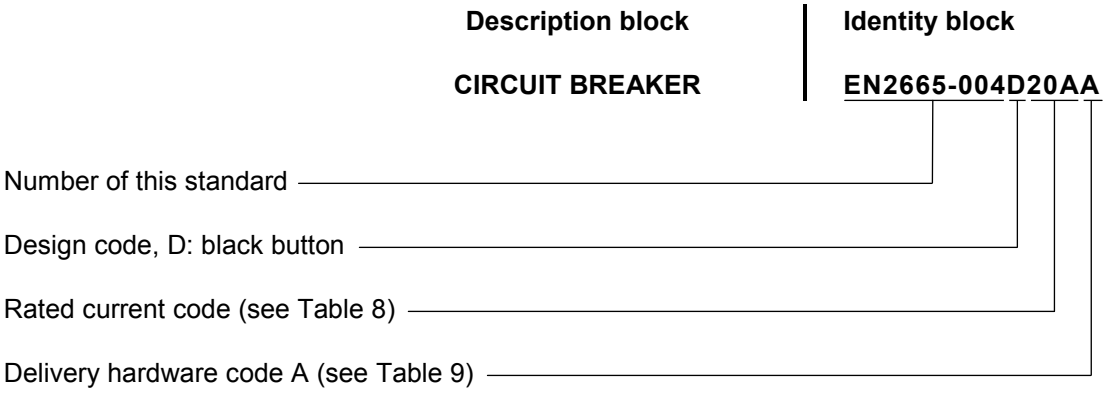
Closed position	**Z = 0 m**	**Z = 15 000 m**
A1, B1, C1 with attachment	1 500 V	400 V
A1, A2 with B1, B2 and C1, C2		
B1, B2 with A1, A2 and C1, C2		
Open position	**Z = 0 m**	**Z = 15 000 m**
A1, B1, C1 with A2, B2, C2	1 500 V	400 V
A1, B1, C1, A2, B2, C2 with attachment		
A1, A2 with B1, B2 and C1, C2		
B1, B2 with A1, A2 and C1, C2		

5.4.8 Insulation resistance

According to EN 2665-001, Table 5.

6 Designation

EXAMPLE



NOTE If necessary, the code I9005 shall be placed between the description block and the identity block.

7 Rated current code

See Table 8.

Table 8

Ratings I_n	20	25	30	35	40	45	50
Marking on actuator	20	25	30	35	40	45	50
Rated current code (A)	20	25	30	35	40	45	50

8 Delivery codes

See Table 9.

Table 9

Delivery hardware code	**Connection and attachment hardware kits EN 6113**			**Delivery conditions**	
	Kit part-No. [a]	**Included parts**	**Pieces per part**	**Fitted**	**Supplied separately**
A	EN 6113C	Connecting screw	6	–	X
		Connecting lock washer	6		
		Attachment nut	1		
		Attachment lock washer	1		
B	EN 6113B	Attachment nut	1	–	X
		Attachment lock washer	1		

[a] Spare parts could be ordered separately, informations see EN 6113.

9 Marking

As defined on the drawing and unless otherwise specified by contract, marking shall include:

— the designation defined in Clause 6 on the packaging;

— the manufacture date (year, week): YYWW

— the manufacturer's name or trademark;

— the electrical diagram and the terminal identification;

— the manufacturer's part number.

NOTE The marking could be combined on the both opposite faces.
For electrical diagram and/or terminal identification refer to the Figure 1.

10 Technical specification

See EN 2665-001.

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™