BS EN 2794-004:2014

BSI Standards Publication

Aerospace series — Circuit breakers, single-pole, temperature compensated, rated currents 20 A to 50 A

Part 004: UNC thread terminals — Product standard

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National foreword

This British Standard is the UK implementation of EN 2794-004:2014. It supersedes BS EN 2794-004:1999 which is withdrawn.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 83446 2

ICS 49.060

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2014.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 2794-004

January 2014

ICS 49.060

Supersedes EN 2794-004:1999

English Version

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

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

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

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

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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Foreword

This document (EN 2794-004:2014) 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.

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1 Scope

This European Standard specifies the characteristics of single-pole circuit breakers, temperature compensated with a rated current from 20 A to 25 A, used in aircraft on-board circuits at a temperature between – 55 °C and 125 °C and at an altitude of 15 000 m max.

These circuit breakers are operated by a push-pull type single push button (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 2794-001, *Aerospace series — Circuit breakers, single-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.

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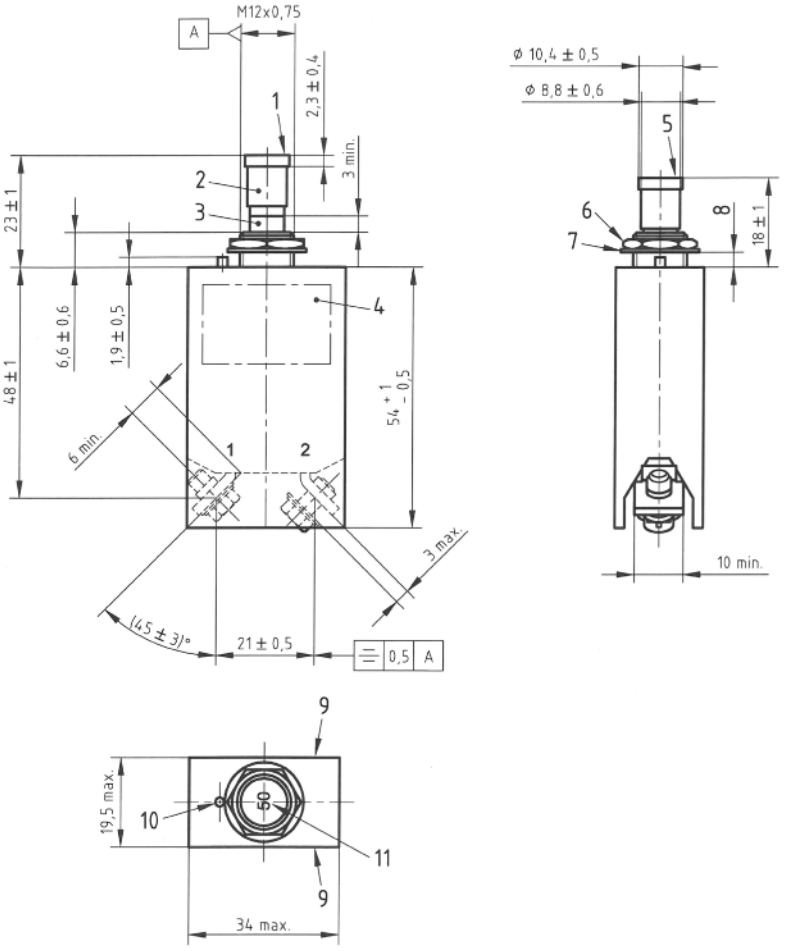
1) Published as ASD-STAN Prestandard at the date of publication of this standard. http://www.asd-stan.org/

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 max. to 3 max
9 Marking, see Clause 6
10 Positioning lug in accordance with the panel cut-out, as per TR 6083C202
11 Rated current marking (white on black)

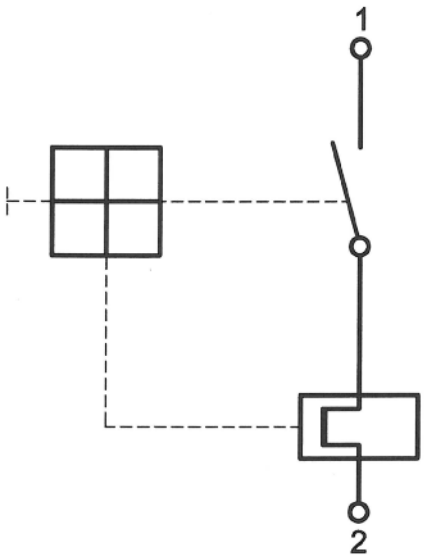
Figure 1 — Configuration – Dimensions – Tolerances

4.2 Electrical diagram

See Figure 2.

Push button released: CB open.

Push button pressed: CB closed.



Key

1 Supply

2 Load

Load and supply can be inverted

Figure 2 — Electrical diagram

4.3 Mass

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

4.4 Panel cut-out

See EN 2794-001.

5 Characteristics

5.1 Material, surface treatment

See EN 2794-001.

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) N.m.

5.2.3 Recommended tightening torque of connection hardware for installation

(2,35 ± 0,15) N.m.

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 2794–001.

Random : 5,8 g_n, see EN 2794–001.

Low frequencies : 10 g_n, see EN 2794–001.

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

Sinusoidal: 3 g_n, see EN 2794-001.

5.2.5 Resistance to shocks

50 g_n, see EN 2794-001.

5.2.6 Mechanical endurance

See Table 6.

5.3 Environment characteristics

5.3.1 Humidity

See EN 2794-001.

5.3.2 Corrosion

See EN 2794-001.

5.3.3 Contaminating liquids

See EN 2794-001.

5.3.4 Overvoltage caused by lightning

See EN 2794-001.

5.4 Electrical characteristics

5.4.1 Nominal voltage of operational circuits

See Table 1.

Table 1

Nominal voltage	28 V d.c.
	115 V a.c., frequency 360 Hz to 800 Hz

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 °C	**Ratings** A	**Minimum thresholds value** > 1 h		**Maximum thresholds value** < 1 h
		On ground	At 15 000 m	On ground
23 ± 5	All	110	105	145
− 55 ± 5		110	105	165
70 ± 5		105	100	145
125 ± 5		90	80	145

5.4.4 Overload trip

See Table 4.

Table 4

		Overload (in % of I_n)		
		200	**500**	**1 000**
Ambient temperatures °C	**Ratings** A	**Trip time** s		
23 ± 5	All	4 to 20	0,15 to 2,50	0,045 to 0,600
− 55 ± 5		≤ 70		
125 ± 5		≥ 1,5		

5.4.5 Short-circuit values

See Table 5.

Table 5

Nominal voltage	28 V d.c.	115 V a.c., 360 Hz to 800 Hz
Prospective currents	4.000 A L/R < 1 ms	0,8 ≤ cos φ ≤ 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	2 500	2 500	2 500
All ratings	**Main contacts**	Applicable	Not applicable	Resistive I_n, 28 V d.c.	Inductive L/R = 5 ms I_n, 28 V d.c.	Inductive 0,6 ≤ cos φ ≤ 0,7I_n, 115 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

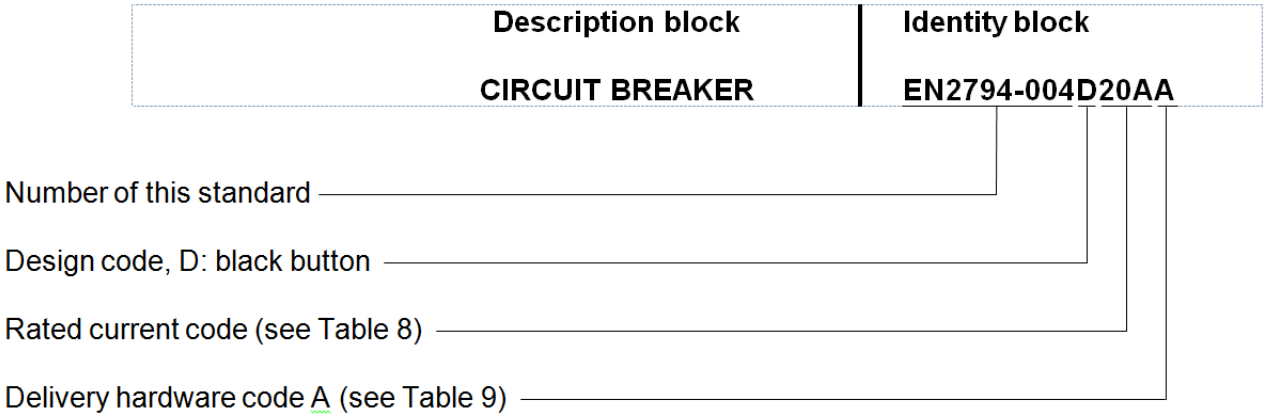
Closed position	**Z = 0 m**	**Z = 15 000 m**
1 and 2 with attachment	1 500 V	400 V
Open position	**Z = 0 m**	**Z = 15 000 m**
1 with 2	1 500 V	400 V
1 and 2 with attachment		

5.4.8 Insulation resistance

According to EN 2794-001, Table 5.

6 Designation

EXAMPLE



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 hardware code

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 6113A	Connecting screw	2	–	X
		Connecting lock washer	2		
		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 pin terminal identification;

— the manufacturer's part number (corresponding to the part number with connection and attachment hardware).

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 2794-001.

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