BS EN 3773-004:2014

BSI Standards Publication

Aerospace series — Circuit breakers, single-pole, temperature compensated, rated currents 1 A to 25 A

Part 004: UNC thread terminals — Product standard

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National foreword

This British Standard is the UK implementation of EN 3773-004:2014. It supersedes BS EN 3773-004:1999 which is withdrawn.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.

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English Version

Aerospace series - Circuit breakers, single-pole, temperature compensated, rated currents 1 A to 25 A - Part 004: UNC thread terminals - Product standard

Série aérospatiale - Disjoncteurs unipolaires compensés en température, intensités nominales 1 A à 25 A - Partie 004 : Bornes à filetage UNC - Norme de produit

Luft- und Raumfahrt - Schutzschalter, einpolig, temperaturkompensiert, Nennströme von 1 A bis 25 A - Teil 004: UNC-Klemmengewinde - Produktnorm

This European Standard was approved by CEN on 12 October 2013.

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

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Foreword

This document (EN 3773-004:2014) 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 1 A to 25 A, used in aircraft on-board circuits at a temperature between – 55 °C and 125 °C and at an altitude of 22 000 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 2282, *Aerospace series — Characteristics of aircraft electrical supplies*

EN 3773-001, *Aerospace series — Circuit breakers, single-pole, temperature compensated, rated currents 1 A to 25 A — Part 001: Technical specification*

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.

See Figure 1.

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

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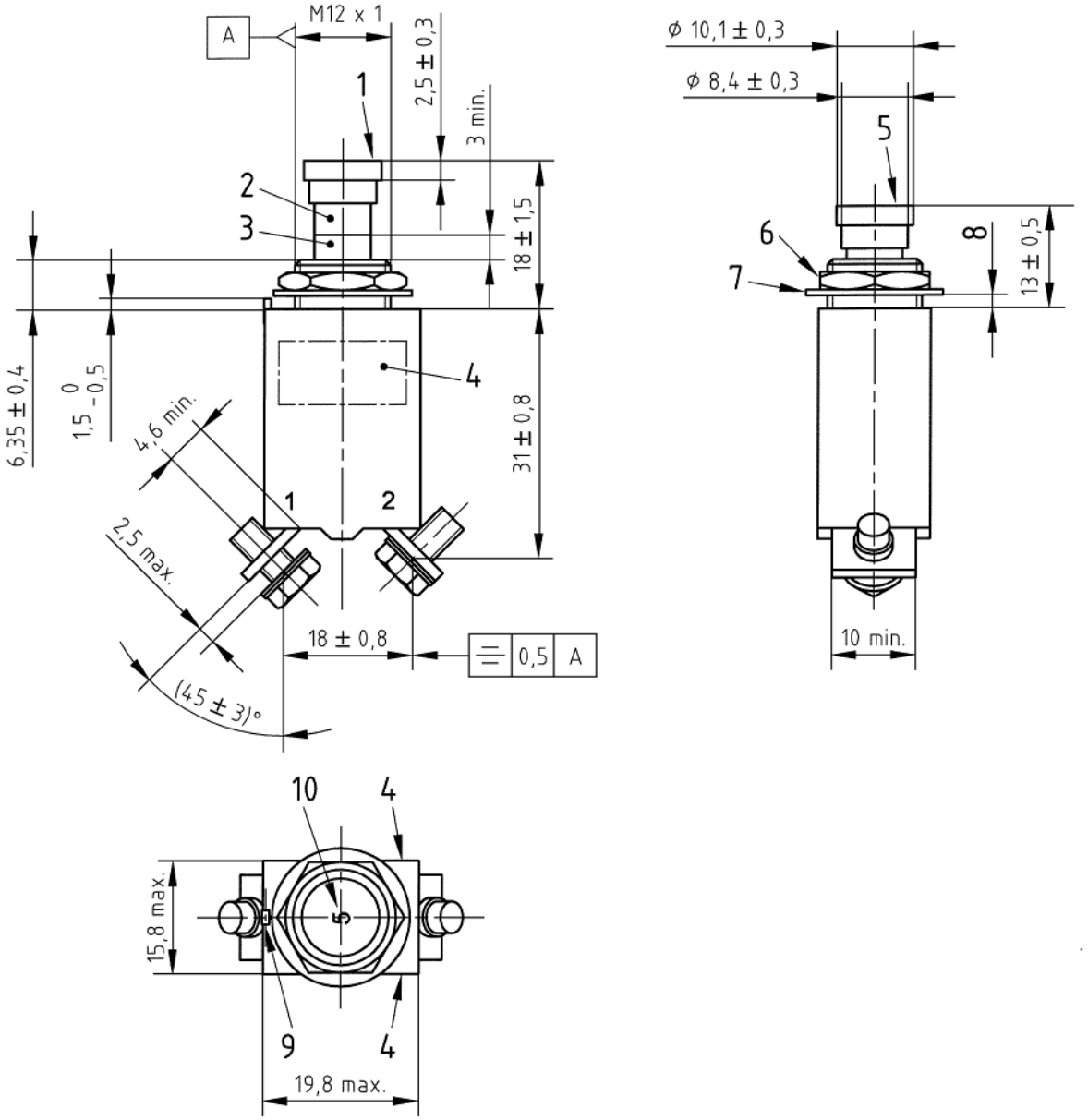
1) Published as ASD-STAN Prestandard at the date of publication of this standard. http://www.asd-stan.org/

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 1,0 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)

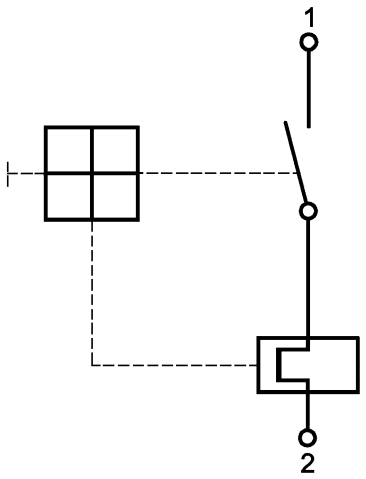
Figure 1 — Circuit breaker

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

26 g max. (delivery hardware code A).

4.4 Panel mounting

See EN 3773-001.

5 Characteristics

5.1 Material, surface treatment

See EN 3773-001.

5.2 Mechanical characteristics

5.2.1 Fasteners

See EN 6113.

5.2.2 Recommended tightening torque of attaching nut for installation

(4,00 ± 0,25) N.m

5.2.3 Recommended tightening torque of connection hardware for installation

(1,6 ± 0,1) 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 3773-001.

Random : 5,8 g_n, see EN 3773-001.

Low frequencies : 10 g_n, see EN 3773-001.

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

Sinusoidal : 3 g_n, see EN 3773-001.

5.2.5 Resistance to shocks

50 g_n, see EN 3773-001.

5.2.6 Mechanical endurance

See Table 6.

5.3 Environment characteristics

5.3.1 Humidity

See EN 3773-001.

5.3.2 Corrosion

See EN 3773-001.

5.3.3 Contaminating liquids

See EN 3773-001.

5.3.4 Overvoltage caused by lightning

See EN 3773-001.

5.4 Electrical characteristics

5.4.1 Nominal voltage of operational circuits

See Table 1.

Table 1

Nominal voltage	28 V d.c.
	26 V a.c., frequency 400 Hz, single-phase
	115 V a.c., frequency 400 Hz, single-phase

When using on a variable frequency aircraft power supply, according to EN 2282, limit values (for voltage and frequency) shall be specified.

5.4.2 Voltage drop at I_n and low current

See Table 2.

Table 2

Ratings A	1	2	2,5	3	5	7,5	10	15	20	25
U max. at I_n V	1,10	0,75	0,70	0,55	0,35	0,30	0,30	0,25	0,25	0,20
U max. at I = 100 mA mV	110	40	30	18	8	4	3	2,5	2,5	2,5
NOTE The test shall be performed when the contact is established (no switching).										

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 22 000 m	On ground
23 ± 5	All	115	105	140
− 55 ± 5		115	105	160
70 ± 5		105	100	140
125 ± 5		100	80	140

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	1 to 3	2 to 13	0,15 to 2,50	0,035 to 0,600
	5 to 15	4 to 18		
	20 to 25	6 to 20		
− 55 ± 5	All	≤ 40		
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., 400 Hz
Prospective currents	65 I_n L/R < 1 ms	0,8 ≤ cos φ ≤ 1
		65 I_n or 1 000 A r.m.s. (value the most favourable)
Test altitudes	On the ground and at maximum altitude 22 000 m (4 000 Pa)	
Number of operations	1 CO [a] + 2 OCO [b] + 1 CO + 2 OCO	

[a] Removal of short-circuit.

[b] Application of a short-circuit.

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	Resistive Low current 100 mA, 28 V d.c. (rating ≤ 3 A)	Resistive I_n, 28 V d.c.	Inductive L/R = 5 ms I_n, 28 V d.c.	Inductive 0,6 ≤ cos φ ≤ 0,7 I_n, 115 V a.c. - 400 Hz
NOTE 1 One operation corresponds to one closing and 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 = 22 000 m**
1 and 2 with attachment	1 500 V	400 V
Open position	**Z = 0 m**	**Z = 22 000 m**
1 with 2 1 and 2 with attachment	1 500 V	400 V

5.4.8 Insulation resistance

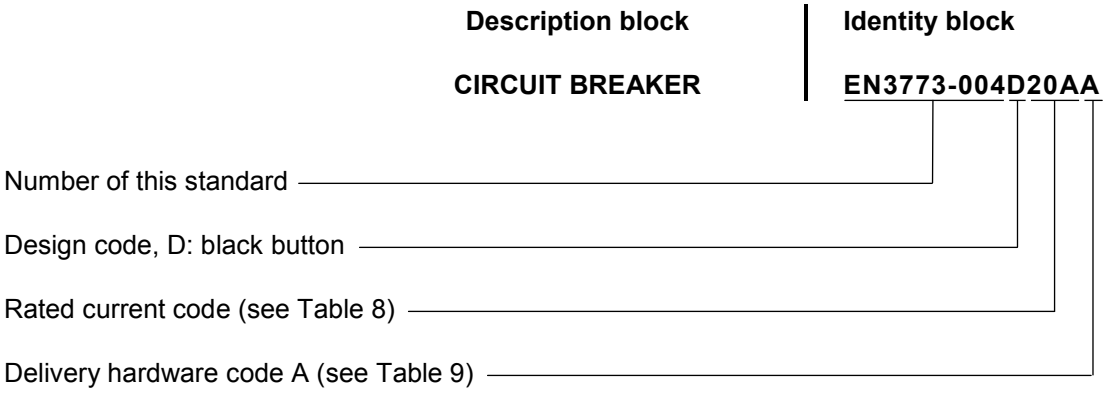
≥ 100 MΩ (measurement points identical to dielectric rigidity points).

5.4.9 Overload endurance

Not applicable.

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	1	2	2,5	3	5	7,5	10	15	20	25
Marking on actuator	1	2	2½	3	5	7½	10	15	20	25
Rated current code	01A	02A	2A5	03A	05A	7A5	10A	15A	20A	25A

8 Delivery hardware 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 6113A1	Connecting screw	2	–	X
		Connecting lock washer	2		
		Attachment nut	1		
		Attachment lock washer	1		
B	EN 6113B1	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 (without delivery hardware code), on the packaging;

— the manufacture date (year, week): YYWW;

— the manufacturer’s name or trademark;

— the pin 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 3773-001.

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