

SLOVENSKI STANDARD

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Nadomešča:

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Aeronavtika - Konektorji, električni, pravokotni, modularni - Stalna delovna temperatura 175 °C - 002. del: Specifikacija lastnosti in razporeditev kontaktov

Aerospace series - Connectors, electrical, rectangular, modular - Operating temperature 175 °C continuous - Part 002: Specification of performance and contact arrangements

Luft- und Raumfahrt - Elektrischer Rechtecksteckverbinder in modularer Bauweise - Betriebstemperatur 175 °C konstant - Teil 002: Leistungsdaten und Kontaktanordnungen

Série aérospatiale - Connecteurs électriques rectangulaires modulaires - Température d'utilisation 175 °C continue - Partie 002: Spécification de performances et arrangement de contacts

Ta slovenski standard je istoveten z: EN 4165-002:2015

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49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD

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English Version

Aerospace series - Connectors, electrical, rectangular, modular -
Operating temperature 175 °C continuous - Part 002:
Specification of performance and contact arrangements

Série aérospatiale - Connecteurs électriques rectangulaires
modulaires - Température d'utilisation 175 °C continu -
Partie 002: Spécification de performances et arrangement
de contacts

Luft- und Raumfahrt - Elektrischer Rechtecksteckverbinder
in modularer Bauweise - Betriebstemperatur 175 °C
konstant - Teil 002: Leistungsdaten und
Kontaktanordnungen

This European Standard was approved by CEN on 5 March 2015.

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

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

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European foreword

This document (EN 4165-002:2015) 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 January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

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.

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EN 4165-002:2015 (E)**1 Scope**

This European standard defines a number of conditions common to rectangular electrical modular connectors for receptacles, plugs and rack and panel, with interchangeable modules and continuous operating temperature 175 °C.

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 2591-209, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 209: Current temperature derating*

EN 3155-002, *Aerospace series — Electrical contacts used in elements of connection — Part 002: List and utilization of contacts*

EN 3155-082, *Aerospace series — Electrical contacts used in elements of connection — Part 082: Contacts, electrical, female, type A, crimp, class S — Product standard*

EN 3197, *Aerospace series — Design and installation of aircraft electrical and optical interconnection systems*

EN 4165-001, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 001: Technical specification*

EN 4165-003, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 003: Modules series 2 and series 3 — Product standard*

EN 4165-004, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 004: Stackable mounting receptacle 2 and 4 modules, series 2 — Product standard*

EN 4165-005, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 005: Stackable mounting receptacle 2 and 4 modules, series 3 — Product standard*

EN 4165-006, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 006: Plug for 2 and 4 modules, series 2 — Product standard*

EN 4165-007, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 007: Plug for 2 and 4 modules, series 3 — Product standard*

EN 4165-008, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 008: Rack and panel plug for 2 and 4 modules, series 2 — Product standard*

EN 4165-009, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 009: Rack and panel plug for 2 and 4 modules, series 3 — Product standard*

EN 4165-010, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 010: Rack and panel rear mounted plug 2 and 4 modules, series 2 — Product standard*

EN 4165-011, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 011: Flange mounting receptacle 2 and 4 modules, series 2 — Product standard*

EN 4165-012, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 012: Flange mounting receptacle 2 and 4 modules, series 3 — Product standard*

EN 4165-013, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 013: Cable clamp 2 and 4 modules for connectors, series 2 and series 3 — Product standard*

EN 4165-014, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 014: Shielded accessory body, 2 and 4 modules for connectors, series 2 and series 3 — Product standard*

EN 4165-015, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 015: Round chimney for accessory (1 per module cavity) — Product standard*

EN 4165-016, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 016: Double oval chimney for accessory (1 per 2 modules) — Product standard*

EN 4165-017, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 017: Blank chimney for accessory (1 per module cavity) — Product standard*

EN 4165-018, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 018: Protective cover for receptacle 2 and 4 modules, series 2 and series 3 — Product standard*

EN 4165-024, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 024: Single module plug — Product standard*

EN 4165-025, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 025: Module receptacle — Product norm*

EN 4165-026, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 026: Accessories for single modules — Product norm*

EN 4165-027, *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous — Part 027: Rack and panel rear mounted plug for 2 and 4 modules, series 3 — Product standard*¹⁾

EN 4529-002, *Aerospace series — Elements of electrical and optical connection — Sealing plugs — Part 002: Index of products standards*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4165-001 apply.

4 Synoptic

For intermountabilities between plugs and receptacles, modules series 2 and series 3, male and female, see Annex A (informative) and Annex B (informative).

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

5 Description and codification of shell classes

See Table 1.

Table 1 — Material and class

Classes	Description
Connectors	
C	Plug and receptacle with housing (shell), composite material unplated, 500 h resistance to salt mist, maximum operating temperature: 175 °C continuous.
W	Plug and receptacle with housing (shell) olive drab cadmium plated, aluminium alloy, 500 h resistance to salt mist, maximum operating temperature: 175 °C continuous.
F	Plug and receptacle with housing (shell) black nickel plated aluminium alloy, 96 h resistance to salt mist, maximum operating temperature: 175 °C continuous.
J	Plug and receptacle with housing (shell) olive drab cadmium plated, composite material, 500 h resistance to salt mist, maximum operating temperature: 175 °C continuous.
M	Plug and receptacle with housing (shell) nickel plated composite material, 500 h resistance to salt mist, maximum operating temperature: 175 °C continuous.
Protective cover	
W	Protective cover for plug and receptacle olive drab cadmium plated, aluminium alloy, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
F	Protective cover for plug and receptacle black nickel plated aluminium alloy, 96 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
M	Protective cover for single module receptacle, nickel plated composite shell, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
Accessories	
C	Cable clamp composite material unplated, 500 h resistance to salt mist, maximum operating temperature: 175 °C continuous
W	Cable clamp in olive drab cadmium plated, aluminium alloy, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
F	Cable clamp in black nickel plated, aluminium alloy, 96 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
W	Accessory with housing (shell) olive drab cadmium plated, aluminium alloy, 500 h resistance to salt mist, maximum operating temperature 175 °C continuous.
F	Accessory with housing (shell) black nickel plated, aluminium alloy, 96 h resistance to salt mist, maximum operating temperature 175 °C continuous
J	Accessory in olive drab cadmium plated, composite shell, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
M	Accessory nickel plated composite shell, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
Chimney for rear accessories	
W	Blank, round, or double oval chimney, olive drab cadmium plated aluminium alloy, 500 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
F	Blank, round, or double oval chimney, black nickel plated, aluminium alloy, 96 h resistance to salt spray, maximum operating temperature: 175 °C continuous.
B	Blank, round, or double oval chimney, nickel plated, aluminium alloy, 48 h resistance to salt spray, maximum operating temperature: 175 °C continuous.

6 Operating conditions

6.1 Combinations of plugs and receptacles

See Annex A (informative) and Annex B (informative).

Table 2 shows the recommended combinations (marked by X) which achieve the characteristics specified for each housing.

The characteristics of the pair of connectors are those of the components with the lowest performance.

Other combinations may be used subject to the approval of the design authority.

Table 2 — Plugs / Receptacles combinations

Plug class	Receptacle class				
	W	F	J	M	C
W	X	–	X	–	X
F	–	X	–	X	X
J	X	–	X	–	X
M	–	X	–	X	X
C	X	X	X	X	X

6.2 Combinations of protective covers and connectors

See Table 3.

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Table 3 — Protective covers / Connectors combinations

Protective cover class	Receptacle class				
	W	F	J	M	C
W	X	–	X	–	X
F	–	X	–	X	X
M	–	X	–	X	X

EN 4165-002:2015 (E)**6.3 Combinations of accessories and connectors**

See Annex A (informative) and Annex B (informative).

See Table 4.

Table 4 — Accessories / Connectors combinations

Accessories class	Plug and receptacle class				
	W	F	J	M	C
W	X	–	X	–	–
F	–	X	–	X	–
J	X	–	X	–	–
M	–	X	–	X	–
C	X	X	X	X	X

6.4 Combinations of chimneys and accessories

See Table 5.

Table 5 — Chimneys / Accessories combinations

Chimneys and blank chimney class	Accessory class				
	W	F	J	M	C
W	X	–	X	–	–
F	–	X	–	X	–
B	–	X	–	X	–

Not applicable for EN 4165-024, EN 4165-025 and EN 4165-026.

6.5 Permissible cables and maximum permissible current

The sealing performance of these connectors is achieved with the cables of dimensions given in Table 6 and using the accessories and wiring tools specified.

The heating caused by the passage of the current shall not cause the exceeding of the maximum temperature. Test EN 2591-209 shall be taken into account.

Table 6 — Cables and maximum current

Size		Size of conductors standard cables		Outer diameter of cables mm		Current A per contact
Contact	Barrel	ASD code	AWG ^a	min.	max.	
22	22	004	22	0,71	1,37	5
		002	24			3
		001	26			2
20	20	006	20	0,85	2,11	7,5
		004	22			5
		002	24			3
20	18	010	18	0,85	2,11	7,5
		006	20			7,5
		004	22			5
		002	24			3
16	16	012	16	1,31	2,62	13
		010	18			10
		006	20			7,5
16	14	020	14	1,63	2,62	13
		012	16			13
		010	18			10
		006	20			7,5
12	12	030	12	1,90	3,70	23
		020	14			13
12	10	Under standardization				
8	8 ^b	—	—	—	—	—

NOTE The use of cables exceeding the maximum diameter indicated is prohibited. Cables smaller than the minimum diameter may be used, subject to a concession, provided that the requirements of EN 3197 are observed.

^a Closest American Wire Gauge

^b The cable for size 8 contacts are specified in the contact product standard (see EN 3155-002).