DIN EN 4733-001

ICS 49.090

Einsprüche bis 2024-03-05

Entwurf

Luft- und Raumfahrt – Optischer Rechtecksteckverbinder in modularer Bauweise – Betriebstemperatur 125 °C, für EN 4734-10X: MT-Kontakte – Teil 001: Technische Lieferbedingungen; Englische Fassung prEN 4733-001:2023

Aerospace series –
Rectangular optical connector, modular –
Operating temperature 125 °C, for EN 4734-10X: MT contacts –
Part 001: Technical specification;
English version prEN 4733-001:2023

Série aérospatiale –
Connecteur optique rectangulaire, modulaire –
Température d'utilisation 125 °C, pour EN 4734-10X: contacts MT –
Partie 001: Spécification technique;
Version anglaise prEN 4733-001:2023

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Dieser Entwurf mit Erscheinungsdatum 2024-01-05 wird der Öffentlichkeit zur Prüfung und Stellungnahme vorgelegt.

Weil das beabsichtigte Dokument von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses Entwurfs besonders zu vereinbaren.

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Gesamtumfang 36 Seiten

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Nationales Vorwort

Der Verband der Europäischen Luft-, Raumfahrt- und Verteidigungsindustrie – Normung (ASD-STAN) ist vom Europäischen Komitee für Normung (CEN) für zuständig erklärt worden, Europäische Normen (EN) für das Gebiet der Luft- und Raumfahrt auszuarbeiten. Durch die Vereinbarung vom 3. Oktober 1986 wurde ASD Assoziierte Organisation (ASB) des CEN.

Das vorliegende Dokument (prEN 4733-001:2024) wurde von ASD-STAN, Fachbereich Elektrotechnik, unter Mitwirkung deutscher Experten des DIN-Normenausschusses Luft- und Raumfahrt (NL) erarbeitet.

Das zuständige deutsche Normungsgremium ist der Arbeitsausschuss NA 131-04-10 AA „LWL und LWL-Komponenten“ im DIN-Normenausschuss Luft- und Raumfahrt (NL).

Der vorliegende Norm-Entwurf enthält zur technischen Kommentierung einen Europäischen Norm-Entwurf (prEN) ausschließlich in Englischer Fassung aus der parallelen Umfrage von ASD-STAN und CEN.

Ein zweiter Norm-Entwurf wird nur die Deutsche Fassung der veröffentlichten ASD-STAN prEN enthalten. Es wird darauf hingewiesen, dass auf Grund der Verfahrensweise zur Normenerstellung bei ASD-STAN der zweite Norm-Entwurf ausschließlich der redaktionellen Prüfung der deutschen Sprachfassung dienen wird.

Entsprechend Beschluss 57/9 des Technischen Ausschusses des Beirats des DIN-Normenausschusses Luft- und Raumfahrt (NL) sind die europäischen Luft- und Raumfahrt-Normungsergebnisse zweisprachig, in Deutsch und Englisch, in das Deutsche Normenwerk zu überführen. Aus diesem Grund wird die Norm beide Sprachfassungen enthalten.

Aktuelle Informationen zu diesem Dokument können über die Internetseiten von DIN (www.din.de) durch eine Suche nach der Dokumentennummer aufgerufen werden.

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– Entwurf –

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 4733-001

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English Version

Aerospace series - Rectangular optical connector, modular - Operating temperature 125 °C, for EN 4734 10X: MT contacts - Part 001: Technical specification

Luft- und Raumfahrt - Optischer Rechtecksteckverbinder in modularer Bauweise, Betriebstemperatur 125 °C, für EN XXXX-10x-MT-Kontakte - Teil 001: Technische Lieferbedingungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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European foreword

This document (prEN 4733-001:2023) 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 document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

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Introduction

This family of fibre optic modules has the same mechanical interface than the one described in EN 4165-001. The module defined in the prEN 4733-003 for two MT optical contacts defined in the EN 4734-10X series can be fitted in either a plug or a receptacle EN 4165-001-compliant.

It is suitable for use on aerospace on board applications. It provides easy access for optical contact end face cleaning.

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1 Scope

This document specifies the general characteristics, the condition for qualification, acceptance and quality assurance, as well as the test programs and groups for EN 4165 rectangular connector with removable module and two EN 4734 MT contacts.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2591 (all parts), *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 3909, *Aerospace series — Test fluids and test methods for electrical and optical components and sub-assemblies*

EN 4165 (all parts), *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous*

prEN 4733-002, *Aerospace series — Rectangular optical connector — Operating temperature 125 °C, for EN 4734-10X: MT contacts — Part 002: Performance specification*[1]

prEN 4733-003, *Aerospace series — Rectangular optical connector, modular — Operating temperature 125 °C, for EN 4734-10X: MT contacts — Part 003: Module double MT contacts, series 2 — product standard*[1]

EN 4734-101, *Aerospace series — Optical fibre contact multi connectors — Part 101: MT male contact 12 ways — Technical specification*[1]

EN 4734-102, *Aerospace series — Optical fibre contact Multi connectors — Part 102: MT female contact 12 ways — Technical specification*[1]

EN 9133, *Aerospace series — Quality Management Systems — Qualification Procedure for Aerospace Standard Products*

TR 4684, *Aerospace series — Electrical and optical technology and component definitions*[2]

CEI-IEC 61754-5, *International standard — Fibre optic connector interfaces — Part 5: Type MT connector family*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in TR 4684 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

[1] In preparation at the date of publication of this document.
[2] Published as ASD-STAN Technical Report at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), https://www.asd-stan.org/.

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4 Description

4.1 General

This document describes an optical connector module to be installed in either a plug or receptacle shells conform to EN 4165-001.

The module uses rear removable optical contacts fitted with a MT ferrule compliant with CEI-IEC 61754-5 as defined in EN 4734.

The precise alignment of the MT contained inside the optical contacts is accomplished by two alignment pins and is secured by the use of a latching spring.

The male MT contact contains alignments pins recessed in the contact body. The female MT contact does not contain alignment pins and its body does not cover the MT.

The module is mechanically held inside the connector shell cavity as defined in EN 4165-001.

Connector type designation as specified in EN 4165-001.

Standard EN 4165 back shell and cable clamp for rectangular connector are not compatible when module equipped with two optical MT contact is mounted in connector.

The module is not waterproof. When only one MT optical contact is equipped in the module, a shutter can be used in the empty cavity to protect the cavity against dust *(in EN 4733-004 TBC)*.

4.2 Receptacle

Receptacle description as specified in EN 4165-001, series 2.

4.3 Plug

Plug description as specified in EN 4165-001 series,2.

4.4 Module

Mechanical interface and polarization between connector housings and module conform to EN 4165-001 series 2 and EN 4165-003.

Module shall be single-bloc type design completed with an integrated MT contact retention system.

The design shall permit individual installation of the contacts without removal of the module from the connector.

The module shall be permanently fitted with a peripheral gasket.

Male module is exclusively fitted with male MT contact, and conversely, female module is exclusively fitted with female MT contact as specified in EN 4734-10X.

Male or female module shall contain two MT contacts cavities each.

4.5 Materials and surface treatment

4.5.1 General

The requirements of EN 4165-001 shall be applied.

4.5.2 Housings

The connector shell description is specified in EN 4165-001 series 2.

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4.5.3 Optical MT contacts

Optical MT contacts shall be made of suitable materials as specified in the product standard EN 4734-10X.

4.5.4 Metallic or non-metallic materials

Materials used for modules, contacts and seals shall have a hardness and mechanical characteristics consistent with the required use.

5 Design

5.1 Housing

The connector housing design is specified in EN 4165-001 series 2.

5.2 Modules

Modules carrying optical contacts shall be in hard material and have a cross section and radii such that no cracks, flaking or breaks can occur in normal operation.

The module shall be single-bloc type design complete with contact retention systems and appropriate seals.

The module is mechanically held in the connector housing by retention clips, and removable with the use of an extraction tool.

The MT contacts retention system shall be integrated in the hard module.

Modules shall permanently contain a peripheral seal.

The design shall permit individual installation of the MT contacts without remove of the module from the connector shell. The installation and the removal of the MT contact shall be by the rear of the module.

The module is fitted by two mechanically polarized cavities for optical MT contact.

5.3 Optical MT contact

Optical MT contacts are spring loaded. The spring force is specified in the product standard EN 4734-10X.

The spring is necessary to ensure a good compression between the two MT ferrules during connector mating. By compressing, the spring allows the MT ferrule to move backwards in the MT contact body.

5.4 Connector mating sequence

5.4.1 General

This connector mating sequence is based on the one described in EN 4165-001

5.4.2 Centre coupling mechanism

The connector mating sequence shall be:

— connector face to face positioning, see Figure 1;

— connector keyways polarization guide, see Figure 2;

— plug – receptacle shell alignment, see Figure 3;

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— central thread coupling, see Figure 3;

— optical MT contact alignment, see Figure 4;

— alignment pins engagement into alignment hole – MT alignment, see Figure 5;

— MT physical contact, see Figure 6;

— optical contact latching spring compression, see Figure 7;

— interfacial seal compression, see Figure 7;

— metal or composite shell to shell bottoming, see Figure 7.

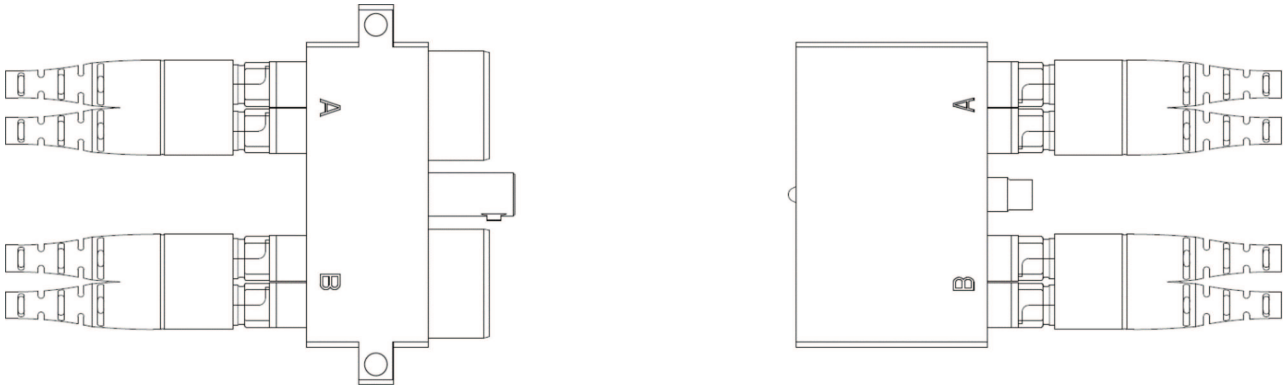

Figure 1 — Face-to-face positioning

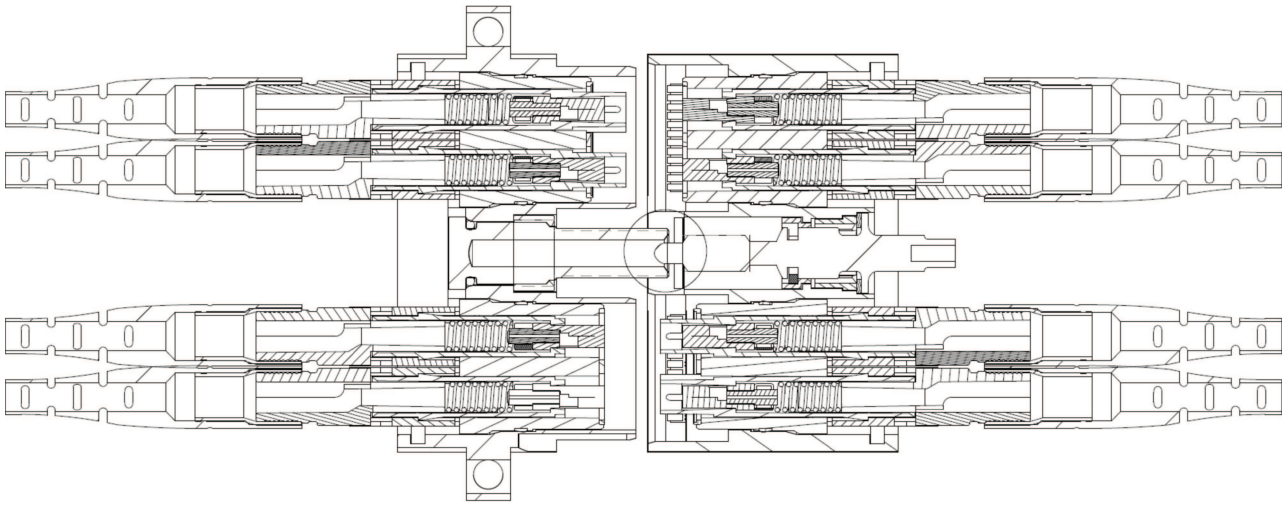

Figure 2 — Keyways polarization guide

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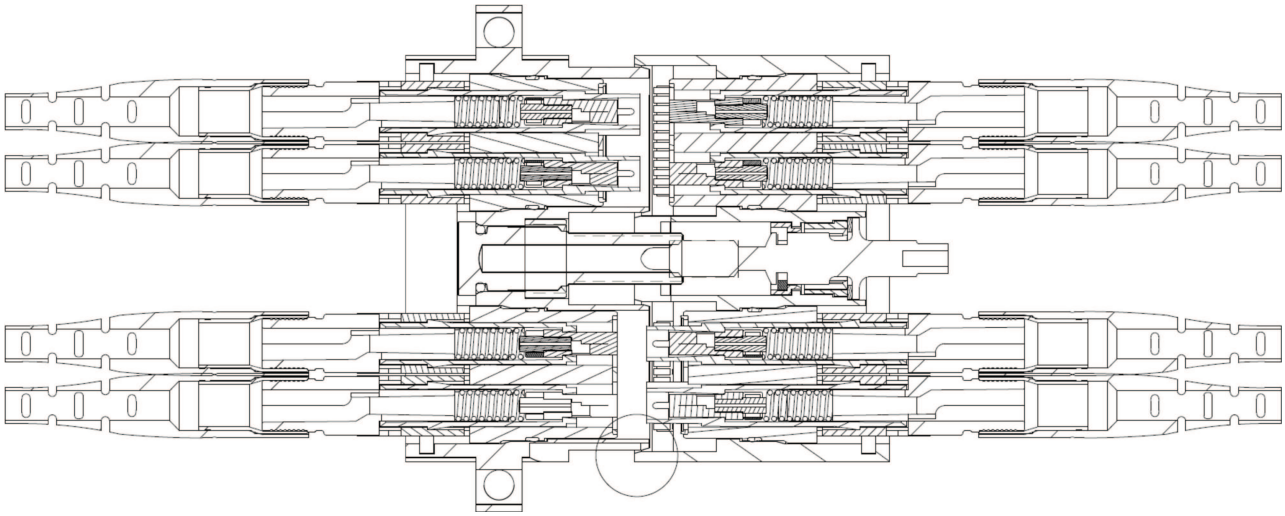

Figure 3 — Shell alignment (receptacle with plug) and central thread coupling

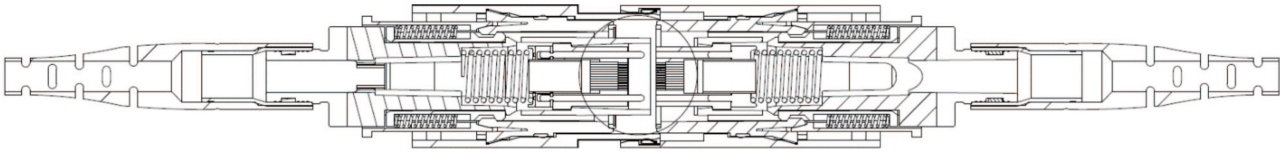

Figure 4 — Optical MT contact alignment (male with female)

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