SLOVENSKI STANDARD
SIST EN 61300-3-18:1999

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Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-18: Examinations and measurements - Keying accuracy of an angled endface connector (IEC 61300-3-18:1995)

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Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren -- Teil 3-18: Untersuchungen und Messungen - Genauigkeit der Polarisierung eines Steckverbinders mit schräger Endfläche

Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-18: Examens et mesures - Précision de détrompage d'un connecteur à face terminale angulaire

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ICS:

33.180.20	Povezovalne naprave za optiļ na vlakna	Fibre optic interconnecting devices

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61300-3-18

August 1997

ICS 33.180.20

English version

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This European Standard was approved by CENELEC on 1997-07-01. CENELEC 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 Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of the International Standard IEC 61300-3-18:1995, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the formal vote and was approved by CENELEC as EN 61300-3-18 on 1997-07-01 without any modification.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-06-01

Endorsement notice

The text of the International Standard IEC 61300-3-18:1995 was approved by CENELEC as a European Standard without any modification.

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Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures –

Partie 3-18: Examens et mesures – Précision du détrompage d'un connecteur à face terminale angulaire

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –

Part 3-18: Examinations and measurements – Keying accuracy of an angled endface connector

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 3-18: Examinations and measurements – Keying accuracy of an angled endface connector

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

International Standard IEC 1300-3-18 has been prepared by sub-committee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

The text of this standard is based on the following documents:

DIS	Report on voting
86B/520/DIS	86B/593/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

IEC 1300 consists of the following parts, under the general title *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures:*

Part 1: General and guidance

Part 2: Tests

Part 3: Examinations and measurements

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 3-18: Examinations and measurements – Keying accuracy of an angled endface connector

1 General

1.1 *Scope and object*

The object of this part of IEC 1300 is to describe a method to measure the angular rotational misalignment of the ferrule mating surface of an angled endface connector and its design orientation angle with respect to its key.

1.2 *General description*

The angle α is defined as the angle between two planes. One plane passes through the axis of the ferrule and the axis of symmetry of the key of the angled endface connector plug (plane A). The second plane passes through the axis of the ferrule and the normal to the ferrule mating surface at the axis of the ferrule or in case of convex polished ferrules, the normal to the tangent plane at the axis of the ferrule endface, plane B (see figure 1).

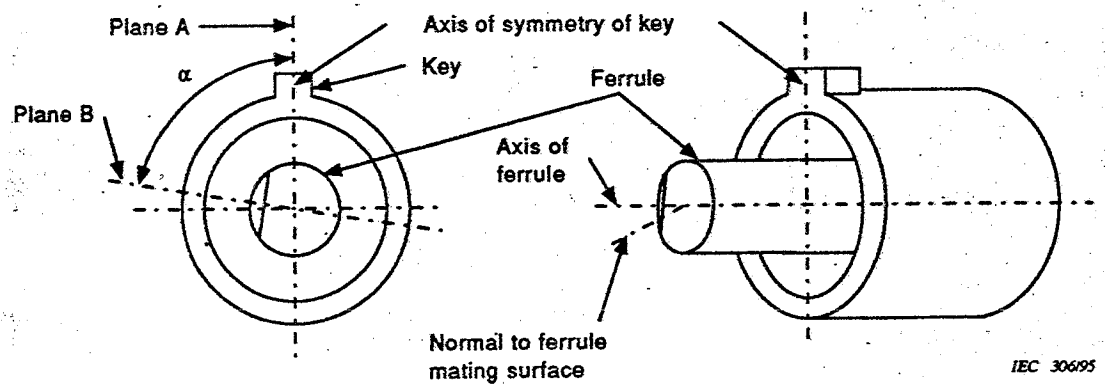

Figure 1 – Definition of angle α

In this method, a visible light He-Ne beam aligned along the ferrule axis is reflected by the ferrule mating surface to impinge upon a screen as a spot pattern. The screen is normal to and surrounding the ferrule axis.

In the case of a flat polished ferrule endface, the spot pattern is typically a small visible, approximately uniformly illuminated circle showing little additional divergence of the laser beam (see figure 2). In the case of a convex polished ferrule endface, the pattern is typically a small ring (Airy disk) located at the centre of a large visible circle of beam diverged from the original laser beam (see figure 2). This small ring results from Fraunhofer diffraction of the He-Ne beam reflected from the convex ferrule endface containing a fibre or fibre hole as a centrally located aperture.

The angle α is determined by measuring the angular positioning of the centre of the visible circle or ring with respect to the orientation of the key. This measurement procedure is corrected for centering by referencing two reflections (corresponding to two keyed positions of the connector holder located at 180° with respect to each other) to the orientation of the key.

The measurement results will be affected by the surface finish of the ferrule mating surface. This surface shall be polished to a sufficient level to form a well-defined specular reflection of the He-Ne beam.

1.3 *Normative reference*

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of IEC 1300. At the time of publication, the edition indicated was valid. All normative documents are subject to revision and parties to agreements based on this part of IEC 1300 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2538: 1974, *Limits and fits – Series of angles and slopes on wedges and prisms*

2 Apparatus

The apparatus consists of the following elements:

– a connector holder consisting of a V-groove or precision alignment sleeve and two slots wherein the connector key can be fitted before and after the connector rotation of 180° (see figure 3) (according to ISO 2538, the preferred angle for a V-groove is 108°);

– a screen perpendicular to the axis of the V-groove or precision sleeve;

– a He-Ne laser whose beam is aligned to be coincident with the axis of the V-groove or precision sleeve and thus impinges on the ferrule mating surface.

3 Procedure

a) Place the ferrule in the V-groove or precision sleeve, fitting the connector key into one slot of the connector holder.

b) Illuminate the ferrule mating surface with the He-Ne beam.

c) Observe the beam spot pattern on the screen and adjust the position of the ferrule to obtain maximum visibility in the interference pattern (see figure 4).

d) Record the position of the centre of the beam spot pattern.

e) Rotate the connector 180°. Place the ferrule in the V-groove or precision sleeve, fitting the connector key into the second slot. Record the second position of the centre of the beam spot pattern.

f) Find the displacement line passing through two centres of the beam spot patterns before and after the connector rotation on the screen. Also find the reference line on the screen and in parallel with a line passing through two centres of the slots of the connector holder.

g) The angle α is the angle between the displacement line and the reference line.

h) The angular misalignment is the difference between this measured α and the design target for α.

4 Details to be specified

The following details, as applicable, shall be specified in the detail specification:

- surface roughness of ferrule mating suface;
- clearance between key and slot;
- allowable angular misalignment.

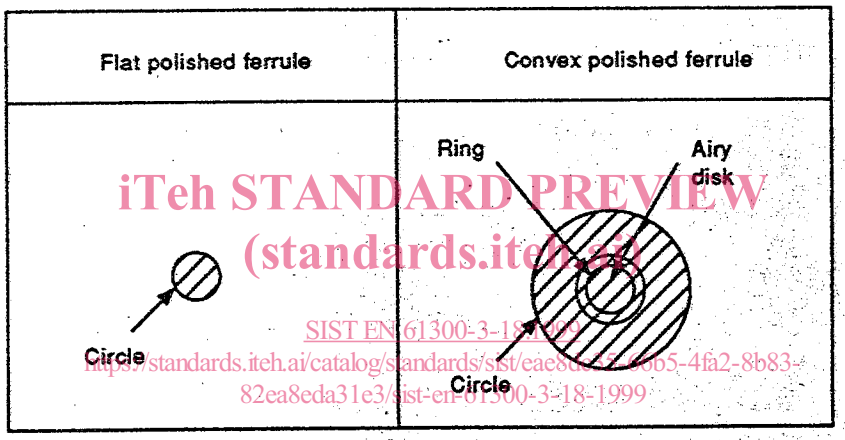

Figure 2 – Typical spot pattern

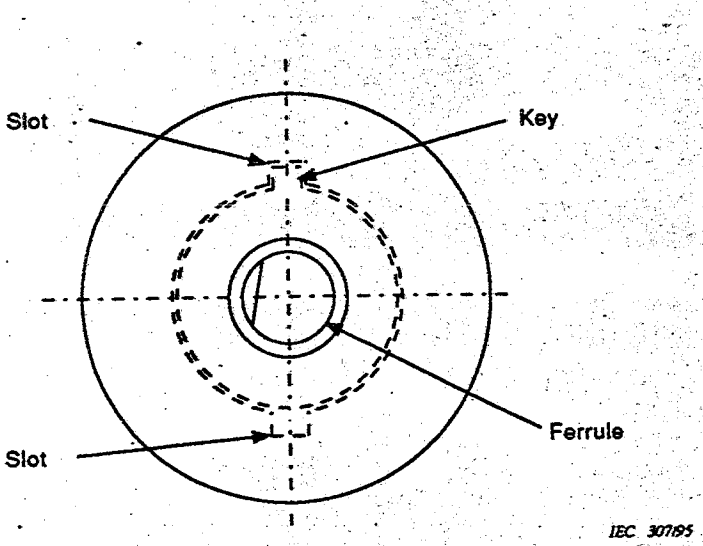

Figure 3 – Example of connector holder