
Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-27: Examinations and measurements - Measurement method for the hole location of a multiway connector plug (IEC 61300-3-27:1997)

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -- Part 3-27: Examinations and measurements - Measurement method for the hole location of a multiway connector plug

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Lichtwellenleiter - Verbindungselemente und passive Bauteile - Grundlegende Prüf- und Meßverfahren -- Teil 3-27: Untersuchungen und Messungen - Meßmethode zur Bestimmung der Lochposition eines Mehrfach-Stiftsteckverbinders

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Dispositifs d'interconnexion et composants passifs à fibres optiques - Méthodes fondamentales d'essais et de mesures -- Partie 3-27: Examens et mesures - Méthode de mesure pour la localisation du trou sur une fiche de connecteur multivoies

Ta slovenski standard je istoveten z: EN 61300-3-27:1997

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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SIST EN 61300-3-27:1999**en**

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English version

**Fibre optic interconnecting devices and passive components
Basic test and measurement procedures
Part 3-27: Examinations and measurements - Measurement method
for the hole location of a multiway connector plug
(IEC 61300-3-27:1997)**

Dispositifs d'interconnexion et
composants passifs à fibres optiques
Méthodes fondamentales d'essais et
de mesures
Partie 3-27: Examens et mesures
Méthode de mesure pour la localisation
du trou sur une fiche de connecteur
multivoies
(CEI 61300-3-27:1997)

Lichtwellenleiter - Verbindungselemente
und passive Bauteile - Grundlegende
Prüf- und Meßverfahren
Teil 3-27: Untersuchungen und
Messungen - Meßmethode zur
Bestimmung der Steckposition eines
Mehrfachsteckverbinders
(IEC 61300-3-27:1997)

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

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

Foreword

The text of document 86B/849/FDIS, future edition 1 of IEC 61300-3-27, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61300-3-27 on 1997-03-11.

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) 1998-02-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1998-02-01

Endorsement notice

The text of the International Standard IEC 61300-3-27:1997 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 3-27:

Examens et mesures –

**Méthode de mesure pour la localisation
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**Fibre optic interconnecting devices
and passive components – Basic test
and measurement procedures –**

Part 3-27:

Examinations and measurements –

**Measurement method for the hole location
of a multiway connector plug**

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

**Part 3-27: Examinations and measurements – Measurement method
for the hole location of a multiway connector plug**

FOREWORD

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International Standard IEC 61300-3-27 has been prepared by subcommittee 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:

FDIS	Report on voting
86B/849/FDIS	86B/958/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 61300 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 3-27: Examinations and measurements – Measurement method for the hole location of a multiway connector plug

1 General

1.1 Scope and object

The object of this part of IEC 61300 is to measure the hole location of a multiway connector plug which has multiple fibre holes for arraying fibres and two guide holes for positioning two alignment pins. The following dimensions on the endface of the plug shall be accurately measured to satisfy the specified mechanical and optical performance of the connector:

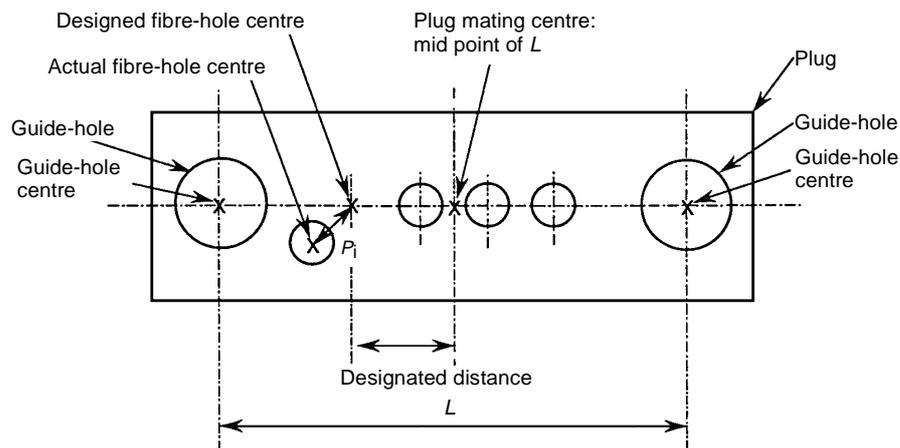
- distance between two guide-hole centres L ;
- position deviation of each fibre-hole centre P_i .

1.2 General description

The distance L is defined as the distance between the centre of one guide hole and the centre of the other guide hole. The position deviation P_i is defined as the position deviation of an actual fibre-hole centre from the intended fibre-hole centre. The intended fibre-hole centre is a point separated by a designated distance from the plug mating centre on the line between the two guide-hole centres (see figure 1).

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These dimensions are measured by a non-contact measurement instrument using an image processing technique.



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L = Distance between two pin-hole centres

P_i = Position deviation of each fibre-hole centre

Figure 1 – Definition of distance L and position deviation P_i

2 Apparatus

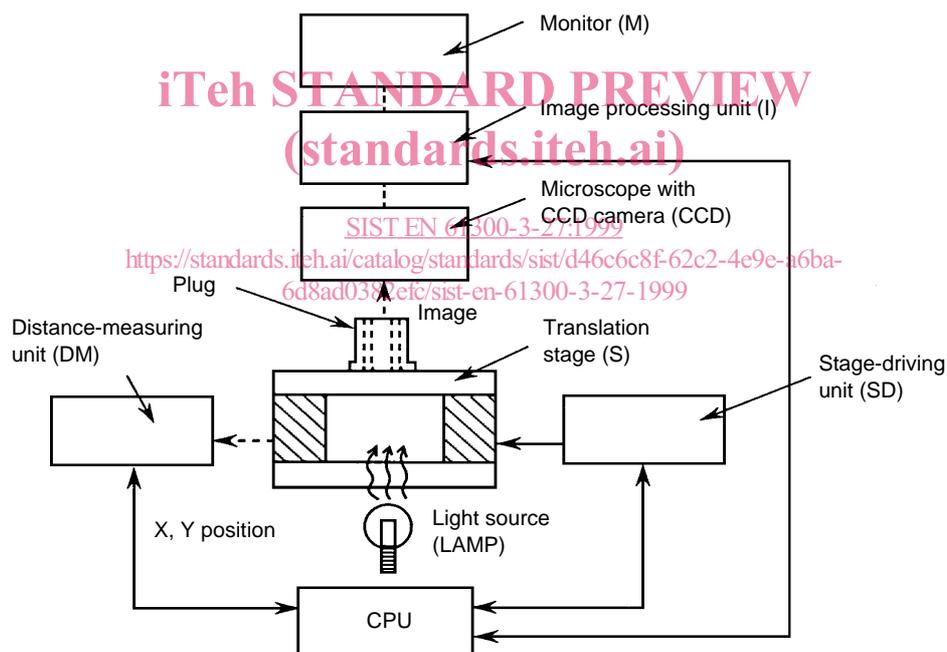
The apparatus consists of the following elements:

- Microscope with CCD camera (CCD)
- Image processing unit I
- Monitor M
- Light source capable of offering diffuse illumination LAMP
- Translation stage S
- Stage-driving unit SD
- Distance-measuring unit DM
- Computer CPU.

3 Procedure

In the following method, calculations on hole location are carried out sequentially for each hole location measurement. The calculations may be performed at the end of all the measurements.

3.1 Configure the measurement set-up as shown in figure 2.



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Figure 2 – Example of set-up for connectors hole location measurement

3.2 Energize the measurement set-up for a sufficient time to achieve stability.

3.3 Mount the plug appropriately on the translation stage S so that the guide-hole axis of the plug is perpendicular to the X,Y-plane of the stage.

3.4 Illuminate the guide holes and the fibre holes.

3.5 Record the original position of the stage using the distance-measuring unit DM. Set (X,Y) co-ordinate on the monitor screen using the image processing unit (I). When moving the stage, the origin of (X,Y) co-ordinate on the monitor screen changes by the distance corresponding to the stage movement.

3.6 Move the translation stage so that the image of target guide hole can be observed on the monitor.

3.7 Record (X, Y) positions of more than three points on a circumference of one guide-hole image. Calculate the centre position (X_{p1}, Y_{p1}) of the circle obtained by fitting a circle to the data points (see figure 3).

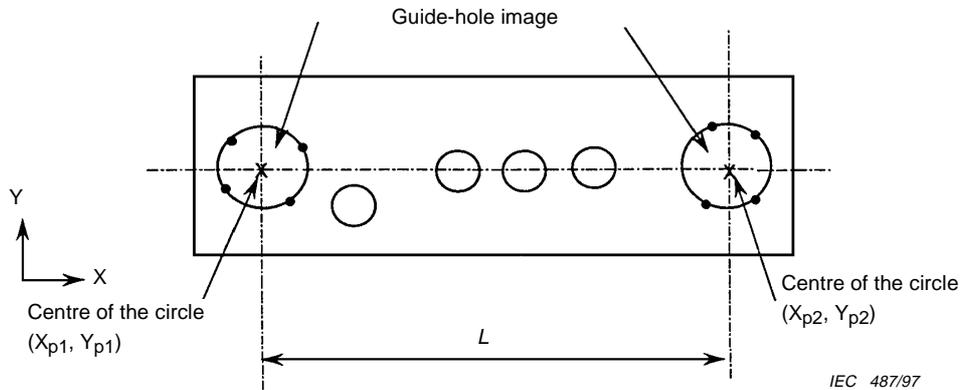


Figure 3 – Example of guide-hole location measurement

3.8 Repeat steps 3.6 and 3.7 for the other guide-hole. Calculate the centre position (X_{p2}, Y_{p2}) of the other circle.

3.9 The distance between two guide-hole centres L is calculated by the following equation:

$$L = \sqrt{(X_{p1} - X_{p2})^2 + (Y_{p1} - Y_{p2})^2}$$

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3.10 Next, determine the plug mating centre (X_c, Y_c) and each intended fibre-hole centre (X_{di}, Y_{di}) from the following calculation. The plug mating centre (X_c, Y_c) is calculated as the mid point between two guide-hole image centres, (X_{p1}, Y_{p1}) and (X_{p2}, Y_{p2}) . The intended fibre-hole centre (X_{di}, Y_{di}) is defined as a point separated by a designated distance from the plug mating centre (X_c, Y_c) . The intended fibre-hole centre should be on the axis of the guide-hole centres (see figure 4).

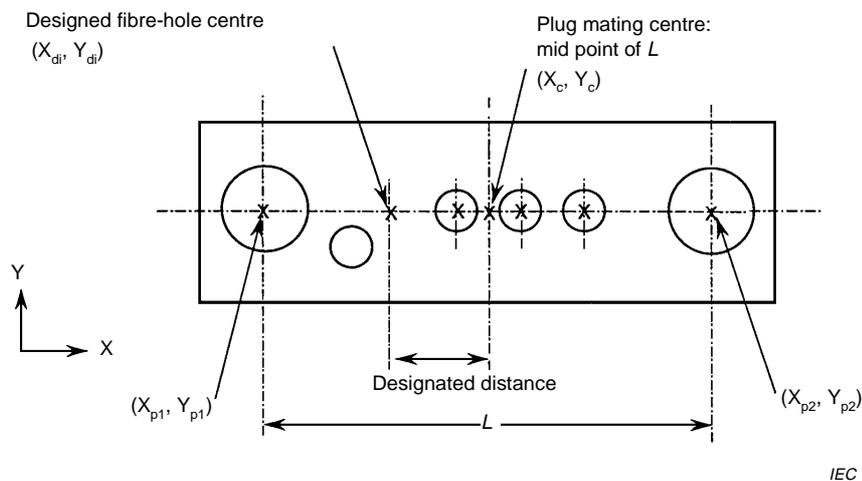


Figure 4 – Determination of intended fibre-hole centre