
Optični spojni elementi in pasivne komponente - Postopki osnovnega preskušanja in merjenja - 3-27. del: Preiskave in meritve - Položaj vodilne odprtine in odprtine/jedra vlakna pri pravokotnih tulkah

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-27: Examinations and measurements - Guide-hole and fibre hole/core position of rectangular ferrules

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ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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oSIST prEN IEC 61300-3-27:2025	en
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86B/5005/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61300-3-27 ED2	
DATE OF CIRCULATION: 2025-03-21	CLOSING DATE FOR VOTING: 2025-06-13
SUPERSEDES DOCUMENTS: 86B/4908/CD, 86B/4932A/CC	

IEC SC 86B : FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS	
SECRETARIAT: Japan	SECRETARY: Mr Ryo Koyama
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED:	
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TITLE:

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-27: Examinations and measurements - Guide-hole and fibre hole/core position of rectangular ferrules

PROPOSED STABILITY DATE: 2033

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES AND
PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –**
**Part 3-27: Examinations and measurements –Guide hole and fibre
hole/core position of rectangular ferrules**

FOREWORD

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117 International Standard IEC 61300-3-27 has been prepared by subcommittee 86B: Fibre optic
118 interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

119 This second edition cancels and replaces the first edition published in 1997. This edition
120 constitutes a technical revision.

121 This edition includes the following significant technical changes with respect to the previous
122 edition:

- 123 a) Change the third title of this document from "Measurement method for the hole location of
124 a multiway connector plug" to "Guide hole and fibre hole/core position of rectangular
125 ferrules";
- 126 b) Addition of the measurement for fibre core locations as well as fibre hole locations;
- 127 c) Change the close structure wholly;

128 d) Addition of Annex A and Annex B.

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

FDIS	Report on voting
86B/XX/FDIS	86B/XX/RVD

130
131 Full information on the voting for the approval of this standard can be found in the report on
132 voting indicated in the above table.

133 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

134 The committee has decided that the contents of this publication will remain unchanged until the
135 stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to
136 the specific publication. At this date, the publication will be

- 137 • reconfirmed,
- 138 • withdrawn,
- 139 • replaced by a revised edition, or
- 140 • amended.

141

142 The National Committees are requested to note that for this publication the stability date
143 is 20XX.

144 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED
145 AT THE PUBLICATION STAGE.

146

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

150
 151 **Part 3-27: Examinations and measurements –Guide hole and fibre**
 152 **hole/core position of rectangular ferrules**
 153

154 **1 Scope**

155 This part of IEC 61300 specifies the methods of measurement for the following:

- 156 - the location of the two guide holes for positioning the two alignment pins, and the location
 157 of multiple fibre holes for arraying fibres and;
- 158 - the fibre core locations within a rectangular connector plug with optical fibres installed.

159 The following dimensions on the endface of the plug are measured to satisfy the specified
 160 mechanical and optical performance of the connector:

- 161 - the distance between the two guide hole centres, L ;
- 162 - the positional deviation of each fibre hole or fibre core centre, P_i , from its designed
 163 position

164 **2 Normative references**

165 There are no normative references in this document.

166 **3 Terms and definitions**

167 No terms and definitions are listed in this document.

168 ISO and IEC maintain terminological databases for use in standardization at the following
 169 addresses:

- 170 · IEC Electropedia: available at <http://www.electropedia.org/>
- 171 · ISO Online browsing platform: available at <http://www.iso.org/obp>

172 **4 General description**

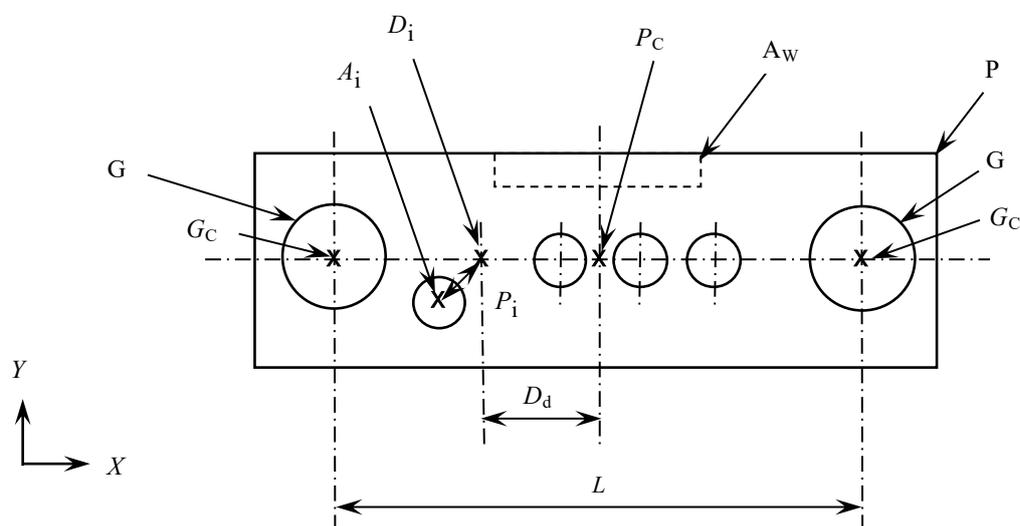
173 **4.1 General**

174 The axis of each guide hole is defined as the centre line of the best-fit cylinder applied over the
 175 region of interest of each guide hole. The distance L is thus defined as the distance between
 176 the points representing the intersection of each guide hole axis and the best fit plane
 177 representing the ferrule end-face. There are two calculation methods, “the least-squares method”
 178 and “the maximum inscribed circle method” as fibre hole’s circle approximation method. Each
 179 fibre hole location should be defined as the geometrical centre position of the maximum
 180 inscribed circle or best-fit circle calculated using least-squares method representing the
 181 intersection of each guide hole axis and the best fit plane representing the ferrule end-face.
 182 The fibre core location is defined as the geometrical centre position of the best-fit circle
 183 representing the illuminated fibre core. The positional error or deviation is the distance between
 184 the fibre hole or fibre core location and the theoretical position of each fibre hole or fibre core
 185 relative to the coordinate datum system established by the guide holes, ferrule end face, and
 186 for angle-polished ferrules, the Y-offset.

187 The methods and information described in this document are based on the use of a measuring
 188 instrument that utilizes non-contact techniques for establishing the datum coordinate system
 189 and positions of key features.

190 When measuring core position of pinned plug, the pin shall be removed.

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Key

- L distance between the two guide hole centres
- D_i theoretical fibre hole or fibre core centre
- A_i measured fibre hole or fibre core centre
- P_i distance between the theoretical and the measured fibre holes or fibre core centre location
- P unpinned plug terminated fibres
- P_C plug mating centre: mid-point of L
- G guide hole
- G_C guide hole centre
- D_d designed distance
- A_w adhesive window

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Figure 1 – Definitions of distance L and positional deviation P_i

196 4.2 Test conditions

197 For precise measurement such as design verification, test condition should be controlled as
 198 recommended in Table 1.

199

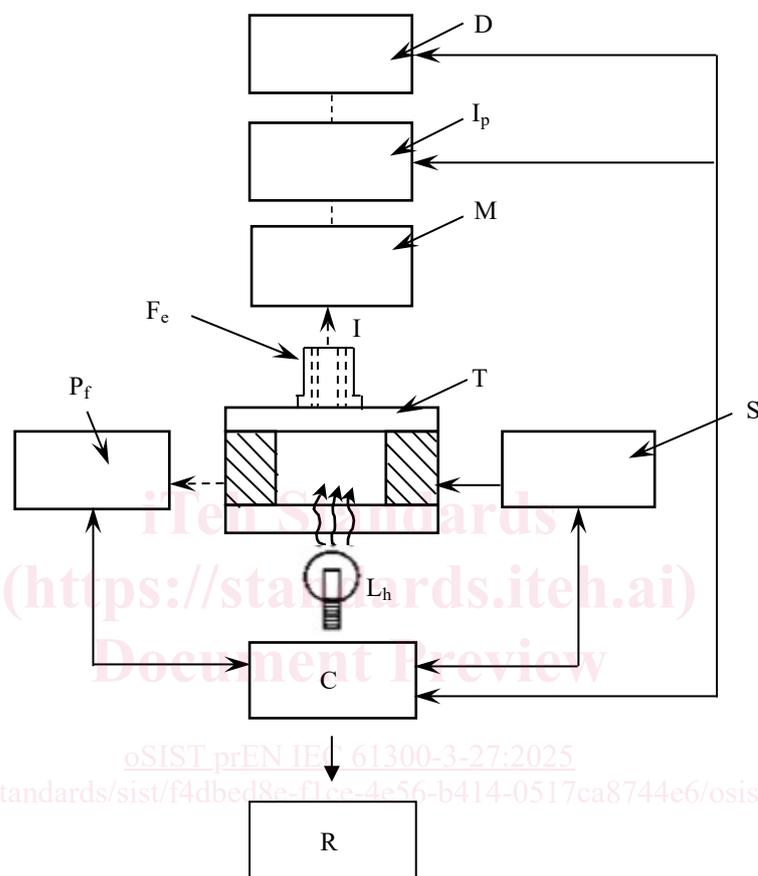
Table 1- Test conditions

Temperature (T)	Relative Humidity (RH)
Both $20\text{ °C} \pm 2\text{ °C}$ and $23\text{ °C} \pm 2\text{ °C}$ can be accepted.	$50,0\% \pm 10,0\%$
NOTE 1 The measurement temperature is described or reported together with the measurement results.	

200

201 **5 Apparatus**202 **5.1 General**

203 An example of the setup for measurement of fibre hole position is shown in Figure 2. An
 204 example of the setup for measurement of fibre core position is shown in Figure 3. Both setups
 205 are suitable for measurement of guide hole distance L .



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206

Key	
D	Display
I _p	Image processing unit
M	Microscope with image sensor
I	Image
F _e	Ferrule
T	Translation stage
P _f	Position feedback unit
S	Stage-driving unit
L _h	Light source for the holes
C	Computer
R	Measurement results

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Figure 2 – Example of measurement set-up for guide holes and fibre holes position of ferrule

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