
Optični spojni elementi in pasivne komponente - Optična prostorska stikala - 1.
del: Splošna specifikacija

Fibre optic interconnecting devices and passive components - Fibre optic spatial switches - Part 1: Generic specification

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Räumliche Umschalter für Lichtwellenleiter - Teil 1: Fachgrundspezifikation

Dispositifs d'interconnexion et composants passifs à fibres optiques - Commutateurs spatiaux à fibres optiques - Partie 1: Spécification générique

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TITLE:

Fibre optic interconnecting devices and passive components - Fibre optic spatial switches - Part 1: Generic specification

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES
 AND PASSIVE COMPONENTS –
 FIBRE OPTIC SPATIAL SWITCHES –**

Part 1: Generic specification

FOREWORD

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International Standard IEC 60876-1 has been prepared by subcommittee SC86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This sixth edition cancels and replaces the fifth edition published in 2014. This document constitutes a technical revision.

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

- a) Harmonized terms and definitions with IEC TS 62627-09;
- b) Changed the content of clause 4, requirements, using references to other existing standards (for example IEC 61753 series) whenever possible;
- c) Addition of an Annex E with an example of mechanical beam-steering switching technologies;
- d) Addition of an informative Annex G including examples of interface styles.

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

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

140

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

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

144 A list of all the parts in the IEC 60876 series, published under the general title *Fibre optic*
145 *interconnecting devices and passive components – Fibre optic spatial switches* can be found
146 on the IEC website.

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

- 150 • reconfirmed,
- 151 • withdrawn,
- 152 • replaced by a revised edition, or
- 153 • amended.

154

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**FIBRE OPTIC INTERCONNECTING DEVICES
AND PASSIVE COMPONENTS –
FIBRE OPTIC SPATIAL SWITCHES –
Part 1: Generic specification**

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162 **1 Scope**

163 This part of IEC 60876 applies to fibre optic switches possessing all of the following general
164 features:

- 165 – they are passive in that they contain no optoelectronic or other transducing elements;
- 166 – they have one or more ports for the transmission of optical power and two or more states in
167 which power may be routed or blocked between these ports;
- 168 – the ports are optical fibres or fibre optic connectors.

169 **2 Normative references**

170 The following documents, in whole or in part, are normatively referenced in this document and
171 are indispensable for its application. For dated references, only the edition cited applies. For
172 undated references, the latest edition of the referenced document (including any amendments)
173 applies.

174 IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

175 IEC 60050-731, *International Electrotechnical Vocabulary – Chapter 731: Optical fibre*
176 *communication*

177 IEC 60617 (all parts), *Graphical symbols for diagrams* (available at <http://std.iec.ch/iec60617>)

178 IEC 60695-11-5, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method –*
179 *Apparatus, confirmatory test arrangement and guidance*

180 IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

181 IEC 61300 (all parts), *Fibre optic interconnecting devices and passive components – Basic test*
182 *and measurement procedures*

183 IEC 61753 (all parts), *Fibre optic interconnecting devices and passive components -*
184 *Performance standard*

185 IEC TR 61930, *Fibre optic graphical symbology*

186 IEC 62005 (all parts), *Reliability of fibre optic interconnecting devices and passive components*

187 IEC 62047-1, *Semiconductor devices – Micro-electromechanical devices – Part 1: Terms and*
188 *definitions*

189 ISO 129-1, *Technical drawings – Indication of dimensions and tolerances – Part 1: General*
190 *principles*

191 ISO 286-1, *Geometrical product specifications (GPS) – ISO code system for tolerances on*
192 *linear sizes – Part 1: Basis of tolerances, deviations and fits*

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193 ISO 1101, *Geometrical product specifications (GPS) – Geometrical tolerancing – Tolerances of*
194 *form, orientation, location and run-out*

195 ISO 8601, *Data elements and interchange formats – Information interchange – Representation*
196 *of dates and times*

197 **3 Terms and definitions**

198 For the purposes of this document, the terms and definitions given in IEC 60050-731 and IEC
199 TS 62627-09 and the following apply.

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

- 202 • IEC Electropedia: available at <https://www.electropedia.org/>
- 203 • ISO Online browsing platform: available at <https://www.iso.org/obp>.

204 **3.1 Basic terms and definitions**

205 **3.1.1**

206 **switch state**

207 particular optical configuration of a switch, whereby optical power is transmitted or blocked
208 between specific ports in a predetermined manner

209 **3.1.2**

210 **actuation mechanism**

211 physical means (mechanical, electrical, acoustic, thermo-optics, etc.) by which a switch is
212 designed to change between states

213 **3.1.3**

214 **actuation energy**

215 input energy required to place a switch in a specific state

216 **3.1.4**

217 **blocking**

218 inability to establish a connection from a free input port to a free output port due to the existence
219 of some other established connection

220 Note 1 to entry: Blocking and various degrees of non-blocking operation functionalities are of various types:

221 “Strict-sense non-blocking” refers to a switch matrix in which it is always possible to establish a connection between
222 any free input port and any free output port, irrespective of previously established connections.

223 “Wide-sense non-blocking” refers to a matrix in which it is always possible to establish a desired connection provided
224 that some systematic procedure is followed in setting up connections. Some multistage switching architectures fall
225 into this category.

226 “Rearrangeably non-blocking” refers to a switch matrix in which any free input port can be connected to any free
227 output port provided that other established connections are unconnected and then reconnected as part of making the
228 new connection.

229 **3.1.5**

230 **normally on**

231 condition where a port pair is in a conducting state when there is no actuation energy applied
232 for a non-latching switch