BS EN IEC 61291-1:2018

BSI Standards Publication

Optical amplifiers

Part 1: Generic specification

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Full document details: BS EN IEC 61291-1:2018

National foreword

This British Standard is the UK implementation of EN IEC 61291-1:2018. It is identical to IEC 61291-1:2018. It supersedes BS EN 61291-1:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/3, Fibre optic systems and active devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61291-1

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ICS 33.180.30

Supersedes EN 61291-1:2012

English Version

Optical amplifiers - Part 1: Generic specification (IEC 61291-1:2018)

Amplificateurs optiques - Partie 1: Spécification générique (IEC 61291-1:2018)

Lichtwellenleiter-Verstärker - Teil 1: Fachgrundspezifikation (IEC 61291-1:2018)

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European foreword

The text of document 86C/1460/CDV, future edition 4 of IEC 61291-1, prepared by IEC/SC 86C "Fibre optic systems and active devices" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61291-1:2018.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-12-27
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-03-27

This document supersedes EN 61291-1:2012.

This edition includes the following significant technical changes with respect to the previous edition:
a) terms have been added for parameters from IEC 61290-4-3 and IEC 61290-10-5;
b) Clause 4 Classification has been removed, since this system is judged to be unused;
c) the definition of polarization mode dispersion (PMD) has been simplified.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61291-1:2018 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60793-2	NOTE	Harmonized as EN 60793-2.
IEC 60825-1	NOTE	Harmonized as EN 60825-1.
IEC 60825-2	NOTE	Harmonized as EN 60825-2.
IEC 60874-1	NOTE	Harmonized as EN 60874-1.
IEC 61000 series	NOTE	Harmonized as EN 61000 series.
IEC 61290-1 series	NOTE	Harmonized as EN 61290-1 series.[1]
IEC 61290-3	NOTE	Harmonized as EN 61290-3.
IEC 61291 series	NOTE	Harmonized as EN 61291 series.

[1] Withdrawn.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-731	-	International Electrotechnical Vocabulary - Chapter 731: Optical fibre communication	-	-
IEC 61290	series	Optical amplifiers - Test methods	EN 61290	series
IEC 61290-1-1	-	Optical amplifiers - Test methods - Part 1-1: Power and gain parameters - Optical spectrum analyzer method	EN 61290-1-1	-
IEC 61290-1-2	-	Optical amplifiers - Test methods -- Part 1-2: Power and gain parameters - Electrical spectrum analyzer method	EN 61290-1-2	-
IEC 61290-1-3	-	Optical amplifiers - Test methods - Part 1-3: Optical power and gain parameters - Optical power meter method	EN 61290-1-3	-
IEC 61290-3-1	-	Optical amplifiers - Test methods -- Part 3-1: Noise figure parameters - Optical spectrum analyzer method	EN 61290-3-1	-
IEC 61290-3-2	-	Optical amplifiers - Test methods -- Part 3-2: Noise figure parameters - Electrical spectrum analyzer method	EN 61290-3-2	-
IEC 61290-4-1	-	Optical amplifiers - Test methods -- Part 4-1: Gain transient parameters – Two wavelength method	EN 61290-4-1	-
IEC 61290-4-2	-	Optical amplifiers - Test methods -- Part 4-2: Gain transient parameters - Broadband source method	EN 61290-4-2	-
IEC 61290-4-3	-	Optical amplifiers - Test methods - Part 4-3: Power transient parameters - Single channel optical amplifiers in output power control	EN 61290-4-3	-
IEC 61290-5-1	-	Optical amplifiers - Test methods -- Part 5-1: Reflectance parameters - Optical spectrum analyzer method	EN 61290-5-1	-
IEC 61290-5-2	-	Optical amplifiers - Test methods -- Part 5-2: Reflectance parameters - Electrical spectrum analyser method	EN 61290-5-2	-
IEC 61290-5-3	-	Optical fibre amplifiers - Basic specification -- Part 5-3: Test methods for reflectance parameters - Reflectance tolerance using an electrical spectrum analyser	EN 61290-5-3	-
IEC 61290-6-1	-	Optical fibre amplifiers - Basic specification -- Part 6-1: Test methods for pump leakage parameters - Optical demultiplexer	EN 61290-6-1	-

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IEC 61290-7-1	-	Optical amplifiers - Test methods -- Part 7-1: Out-of-band insertion losses - Filtered optical power meter method	EN 61290-7-1	-
IEC 61290-10-1	-	Optical amplifiers - Test methods -- Part 10-1: Multichannel parameters - Pulse method using an optical switch and optical spectrum analyser	EN 61290-10-1	-
IEC 61290-10-2	-	Optical amplifiers - Test methods -- Part 10-2: Multichannel parameters - Pulse method using a gated optical spectrum analyzer	EN 61290-10-2	-
IEC 61290-10-3	-	Optical amplifiers - Test methods -- Part 10-3: Multichannel parameters - Probe methods	EN 61290-10-3	-
IEC 61290-10-4	-	Optical amplifiers - Test methods -- Part 10-4: Multichannel parameters - Interpolated source subtraction method using an optical spectrum analyzer	EN 61290-10-4	-
IEC 61290-10-5	-	Optical amplifiers - Test methods -- Part 10-5: Multichannel parameters - Distributed Raman amplifier gain and noise figure	EN 61290-10-5	-
IEC 61290-11-1	-	Optical amplifier - Test methods -- Part 11-1: Polarization mode dispersion parameter - Jones matrix eigenanalysis (JME)	EN 61290-11-1	-
IEC 61290-11-2	-	Optical amplifiers - Test methods -- Part 11-2: Polarization mode dispersion parameter - Poincaré sphere analysis method	EN 61290-11-2	-
IEC 61291-5-2	-	Optical amplifiers - Part 5-2: Qualification specifications - Reliability qualification for optical fibre amplifiers	EN 61291-5-2	-
IEC/TR 61931	-	Fibre optic - Terminology	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL AMPLIFIERS –

Part 1: Generic specification

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61291-1 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This fourth edition cancels and replaces the third edition published in 2012. This edition constitutes a technical revision.

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

a) terms have been added for parameters from IEC 61290-4-3 and IEC 61290-10-5;
b) Clause 4 Classification has been removed, since this system is judged to be unused;
c) the definition of polarization mode dispersion (PMD) has been simplified.

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The text of this International Standard is based on the following documents:

CDV	Report on voting
86C/1460/CDV	86C/1498/RVC

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

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

A list of all parts in the IEC 61291 series, published under the general title *Optical amplifiers*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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OPTICAL AMPLIFIERS –

Part 1: Generic specification

1 Scope

This part of IEC 61291 applies to all commercially available optical amplifiers (OAs) and optically amplified assemblies. It applies to OAs using optically pumped fibres (OFAs based either on rare-earth doped fibres or on the Raman effect), semiconductors (SOAs), and waveguides (POWAs).

The object of this document is

– to establish uniform requirements for transmission, operation, reliability and environmental properties of OAs, and
– to provide assistance to the purchaser in the selection of consistently high-quality OA products for his particular applications.

Parameters specified for OAs are those characterizing the transmission, operation, reliability and environmental properties of the OA seen as a "black box" from a general point of view. In the sectional and detail specifications a subset of these parameters will be specified according to the type and application of the particular OA device or assembly.

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.

IEC 60050-731, *International Electrotechnical Vocabulary – Chapter 731: Optical fibre communication* (available at http://www.electropedia.org)

IEC 61290 (all parts), *Optical amplifiers – Test methods*

IEC 61290-1-1, *Optical amplifiers – Test methods – Part 1-1: Power and gain parameters – Optical spectrum analyzer method*

IEC 61290-1-2, *Optical amplifiers – Test methods – Part 1-2: Power and gain parameters – Electrical spectrum analyzer method*

IEC 61290-1-3, *Optical amplifiers – Test methods – Part 1-3: Power and gain parameters – Optical power meter method*

IEC 61290-3-1, *Optical amplifiers – Test methods – Part 3-1: Noise figure parameters – Optical spectrum analyzer method*

IEC 61290-3-2, *Optical amplifiers – Test methods – Part 3-2: Noise figure parameters – Electrical spectrum analyzer method*

IEC 61290-4-1, *Optical amplifiers – Test methods – Part 4-1: Gain transient parameters – Two wavelength method*

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IEC 61290-4-2, *Optical amplifiers – Test methods – Part 4-2: Gain transient parameters – Broadband source method*

IEC 61290-4-3, *Optical amplifiers – Test methods – Part 4-3: Power transient parameters – Single channel optical amplifiers in output power control*

IEC 61290-5-1, *Optical amplifiers – Test methods – Part 5-1: Reflectance parameters – Optical spectrum analyzer method*

IEC 61290-5-2, *Optical amplifiers – Test methods – Part 5-2: Reflectance parameters – Electrical spectrum analyzer method*

IEC 61290-5-3, *Optical fibre amplifiers – Basic specification– Part 5-3: Test methods for reflectance parameters – Reflectance tolerance using an electrical spectrum analyzer*

IEC 61290-6-1, *Optical fibre amplifiers – Basic specification – Part 6-1: Test methods for pump leakage parameters – Optical demultiplexer*

IEC 61290-7-1, *Optical amplifiers – Test methods – Part 7-1: Out-of-band insertion losses – Filtered optical power meter method*

IEC 61290-10-1, *Optical amplifiers – Test methods – Part 10-1: Multichannel parameters – Pulse method using an optical switch and optical spectrum analyzer*

IEC 61290-10-2, *Optical amplifiers – Test methods – Part 10-2: Multichannel parameters – Pulse method using a gated optical spectrum analyzer*

IEC 61290-10-3, *Optical amplifiers – Test methods – Part 10-3: Multichannel parameters – Probe methods*

IEC 61290-10-4, *Optical amplifiers – Test methods – Part 10-4: Multichannel parameters – Interpolated source subtraction method using an optical spectrum analyzer*

IEC 61290-10-5, *Optical amplifiers – Test methods – Part 10-5: Multichannel parameters – Distributed Raman amplifier gain and noise figure*

IEC 61290-11-1, *Optical amplifiers – Test methods – Part 11-1: Polarization mode dispersion parameter – Jones matrix eigenanalysis (JME)*

IEC 61290-11-2, *Optical amplifiers – Test methods – Part 11-2: Polarization mode dispersion parameter – Poincaré sphere analysis method*

IEC 61291-5-2, *Optical amplifiers – Part 5-2: Qualification specifications – Reliability qualification for optical fibre amplifiers*

IEC TR 61931, *Fibre optic – Terminology*

3 Terms, definitions and abbreviated terms

3.1 Overview

The definitions listed in 3.2 refer to the meaning of the terms used in the specifications of OAs. Only those parameters listed in the appropriate specification template, as in IEC 61291-2 and IEC 61291-4, are intended to be specified.

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