SLOVENSKI STANDARD
SIST EN 61290-4-3:2016

01-februar-2016

Optični ojačevalniki - Preskusne metode - 4-3. del: Električni parametri ojačanja - Enokanalni optični ojačevalniki za izhodno krmiljenje moči (IEC 61290-4-3:2015)

Optical amplifiers - Test methods - Part 4-3: Power transient parameters - Single channel optical amplifiers in output power control (IEC 61290-4-3:2015)

Optische Verstärker - Prüfverfahren - Teil 4-3: Leistungs-Transientenkenngrößen von Ein -Kanal-LWL-Verstärkern mit Ausgangs-Leistungskontrolle (IEC 61290-4-3:2015)

Amplificateurs optiques - Méthodes d'essai - Partie 4-3: Paramètres de puissance transitoire - Contrôle de la puissance de sortie des amplificateurs optiques monocanaux (IEC 61290-4-3:2015)

Ta slovenski standard je istoveten z: **EN 61290-4-3:2015**

ICS:

33.180.30	Optični ojačevalniki	Optic amplifiers

SIST EN 61290-4-3:2016 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61290-4-3

November 2015

ICS 33.180.30

English Version

Optical amplifiers - Test methods - Part 4-3: Power transient parameters - Single channel optical amplifiers in output power control (IEC 61290-4-3:2015)

Amplificateurs optiques - Méthodes d'essai - Partie 4-3: Paramètres de puissance transitoire - Contrôle de la puissance de sortie des amplificateurs optiques monocanaux (IEC 61290-4-3:2015)

Optische Verstärker - Prüfverfahren - Teil 4-3: Leistungs-Transientenkenngrößen von Ein-Kanal-LWL-Verstärkern mit Ausgangs-Leistungskontrolle (IEC 61290-4-3:2015)

This European Standard was approved by CENELEC on 2015-06-09. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 86C/1310/FDIS, future edition 1 of IEC 61290-4-3, prepared by 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 61290-4-3:2015.

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) 2016-05-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-06-09

This standard is to be used in conjunction with EN 61290-1:2012.

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

Endorsement notice

The text of the International Standard IEC 61290-4-3:2015 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 61290-3-3	NOTE	Harmonized as EN 61290-3-3.
IEC 61290-4-1	NOTE	Harmonized as EN 61290-4-1.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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

NOTE 1 When 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 61291-1	2012	Optical amplifiers - Part 1: Generic specification	EN 61291-1	2012

IEC 61290-4-3

Edition 1.0 2015-05

INTERNATIONAL STANDARD

colour inside

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.30

ISBN 978-2-8322-2670-4

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

OPTICAL AMPLIFIERS – TEST METHODS

Part 4-3: Power transient parameters – Single channel optical amplifiers in output power control

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61290-4-3 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This International Standard is to be used in conjunction with IEC 61291-1:2012, on the basis of which it was established.

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

FDIS	Report on voting
86C/1310/FDIS	86C/1329/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.

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

A list of all parts of the IEC 61290 series, published under the general title *Optical amplifiers – Test methods*[1)] can be found on the IEC website.

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

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

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

1) The first editions of some of these parts were published under the general title *Optical fibre amplifiers – Basic specification* or *Optical amplifier test methods*.

OPTICAL AMPLIFIERS – TEST METHODS

Part 4-3: Power transient parameters – Single channel optical amplifiers in output power control

1 Scope

This part of IEC 61290 applies to output power controlled optically amplified, elementary sub-systems. It applies to optical fibre amplifiers (OFA) using active fibres containing rare-earth dopants, presently commercially available, as indicated in IEC 61291-1, as well as alternative optical amplifiers that can be used for single channel output power controlled operation, such as semiconductor optical amplifiers (SOA).

The object of this standard is to provide the general background for optical amplifier (OA) power transients and its measurements and to indicate those IEC standard test methods for accurate and reliable measurements of the following transient parameters:

a) Transient power response

b) Transient power overcompensation response

c) Steady-state power offset

d) Transient power response time

The stimulus and responses behaviours under consideration include:

1) Channel power increase (step transient)

2) Channel power reduction (inverse step transient)

3) Channel power increase/reduction (pulse transient)

4) Channel power reduction/increase (inverse pulse transient)

5) Channel power increase/reduction/increase (lightning bolt transient)

6) Channel power reduction/increase/reduction (inverse lightning bolt transient)

These parameters have been included to provide a complete description of the transient behaviour of an output power transient controlled OA. The test definition defined here are applicable if the amplifier is an OFA or an alternative OA. However, the description in Annex A of this document concentrates on the physical performance of an OFA and provides a detailed description of the behaviour of OFA; it does not give a similar description of other OA types.

2 Normative references

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

IEC 61291-1:2012, *Optical amplifiers – Part 1: Generic specification*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
input signal
optical signal that is input to the OA

3.1.2
input power excursion
relative input power difference in dB before, during and after the input power stimulus event that causes an OA transient power excursion.

3.1.3
input power rise time
time it takes for the input optical signal to rise from 10 % to 90 % of the total difference between the initial and final signal levels during an increasing power excursion event

Note 1 to entry: see Figure A.2

3.1.4
input power fall time
time it takes for the input optical signal to fall from 10 % to 90 % of the total difference between the initial and final signal levels during a decreasing power excursion event

Note 1 to entry: see Figure A.2

3.1.5
slew rate
maximum rate of change of the input optical signal during a power excursion event

3.1.6
transient power response
maximum or minimum deviation (overshoot or undershoot) in dB between the OA's target power and the observed power excursion induced by a change in an input channel power excursion

Note 1 to entry: Once the output power of an amplified channel deviates from its target power, the control electronics in the OA should attempt to compensate for the power difference or transient power response, bringing the OA output power back to its original target level.

3.1.7
transient power settling time
amount of time taken to restore the power of the OA to a stable power level close to the target power level

Note 1 to entry: This parameter is measured from the time when stimulus event that created the power fluctuation to the time at which the OA power response is stable and within specification.

3.1.8
transient power overcompensation response
maximum deviation in dB between the amplifier's target output power and the power resulting from the control electronics instability

Note 1 to entry: Transient power overcompensation response occurs after a power excursion, when an amplifier's control electronics attempts to bring the power back to the amplifier's target level. The control process is iterative, and control electronics may initially overcompensate for the power excursion until subsequently reaching the desired target power level.