Draft for Public Comment

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Interested committees:

Title: Draft BS EN 62906-5-5 Laser display devices. Part 5-5: Optical measuring methods of raster-scanning retina direct projection devices.

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Responsible Committee Secretary: Committee Service Centre (BSI)
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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at **https://standardsdevelopment.bsigroup.com/**. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex **(e.g. 3.1)**	Paragraph/Figure/ Table/Note	**Type of comment**	**Commend (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations on each comment submitted**
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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110/981/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: **IEC 62906-5-5 ED1**	
DATE OF CIRCULATION: **2018-05-04**	CLOSING DATE FOR COMMENTS: **2018-06-29**
SUPERSEDES DOCUMENTS: **110/857/NP,110/875A/RVN**	

IEC TC 110 : ELECTRONIC DISPLAY DEVICES	
SECRETARIAT: Japan	SECRETARY: Mr Yoshi SHIBAHARA
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 76,TC 100	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Laser display devices – Part 5-5: Optical measuring methods of raster-scanning retina direct projection devices

NOTE FROM TC/SC OFFICERS:

As the adHoc meeting of IEC TC 110 WG 10 will be held on May 18th, 2018 at LA, CA USA, all NCs are invited to submit their comments by that date to allow discussion during that meeting. Kindly submit the comments to the IEC TC 110 secretary in parallel with the submission through the IEC voting system.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LASER DISPLAY DEVICES –
Part 5-5: Optical measuring methods of raster-scanning retina direct projection laser display devices –

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International Standard IEC 62906-5-5 has been prepared by IEC technical committee 110: Electronic display devices.

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

NP	Report on voting
110/XX/NP	110/XX/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.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

A list of all parts of the IEC 62906 series, under the general title *Laser display devices*, can be found on the IEC website.

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The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

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

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LASER DISPLAY DEVICES –

Part 5-5: Optical measuring methods of raster-scanning retina direct projection laser display devices –

1 Scope

This part of IEC 62906 specifies the standard measurement conditions and optical measuring methods for raster-scanning retina direct projection laser display devices.

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.

IEC61906-1-2: *Laser display devices – Part 1-2: Vocabulary and letter symbols*

IEC 60825-1 Ed.3.0:*Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60050: *International Electrotechnical Vocabulary*

ICNIRP. Guidelines on limits of exposure to laser radiation of wavelengths between 180 nm and 1000 nm, Health Phys. 105(3) pp. 271 - 295 (2013).

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

• IEC Electropedia: available at http://www.electropedia.org/

• ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
raster-scanning retina direct projection laser display device
RS-RDP LDD
direct laser projection system to retina, that the display does not need actual or virtual screen for observation

Note 1 to entry: For examples, see Annex A

3.1.2
retinal imaging
projection and observation of image by the Maxwellian view

Note 1 to entry: The Maxwellian view is a method of observation in which a converging lens forms an image of the light source in the plane of the eye's pupil of the observer, instead of looking at the source directly. For examples, see Annex B

3.1.3
Effective angular resolution, <of a RS-RDP LDD>
resolution of the projected image on human retina expressed as the pixel per degree

3.1.4
focal point
smallest beam spot point in the vicinity of the exit of the optical system of RS-RDP LDD

3.1.5
pupil offset
distance between focal point and the centre of pupil

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3.1.6
differential image resolution
$\Delta R/\Delta f$
derivative of image resolution R with respect to the focal length f of lens in the pupil of eyeball model

3.1.7
eyebox
three-dimensional volume that the full displayed image can be observed

3.2 Abbreviations

CW	continuous wave (a term widely used in the laser industry from a viewpoint of light output. Equivalent to DC: direct current from a viewpoint of driving electrical current ← → pulse)
DUT	device under test
FOV	field of view
LD	laser diode
LDD	laser display devices
LMD	light measuring device
MEMS	microelectromechanical system
IPD	inter-pupillary distance
RGB	red, green, and blue
SFR	spatial frequency response
2D	two-dimension, two-dimensional

4 Standard measuring conditions

4.1 Standard measuring environmental conditions

Optical measurements related to RS-RDP LDD shall be carried out under the standard environmental conditions:

– Temperature: 25 ºC ± 3 ºC,
– Relative humidity: 25% to 85% RH,
– Atmospheric pressure: 86 kPa to 106 kPa.

when different environmental conditions are used, they shall be noted in the measurement report.

The darkroom luminance contribution from the background light shall be ≤ 0,01 lx.

4.2 Coordinate systems

The measurement coordinate systems are shown in Figure 1. The origin of the coordinate systems is placed at the focal point of the RS-RDP LDD. In the Cartesian system, the horizontal x axis and the vertical y axis are parallel and normal to the line between the two eyes, respectively. The z axis is normal to the x-y plane. In the polar coordinate system, zenith angle θ and azimuth angle ϕ are also defined in Figure 1.

The optical measurements shall be carried out either on a planar sensor parallel to the x-y plane. The coordinate conversion between the retinal screen and the planar screen is shown in Annex C.3. It should be noted that the focal point usually does not coincide exactly with the centre surface of the pupil.

The length from the focal point to the planar screen L_{screen} shall be 22 mm because of the retina position of human eye.

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