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REDLINE VERSION

INTERNATIONAL STANDARD

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Car Multimedia systems and equipment for vehicles – ~~Drive monitoring~~ Surround view system – Part 3: Measurement methods

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CONTENTS

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~~CAR~~ MULTIMEDIA SYSTEMS AND EQUIPMENT FOR VEHICLES – ~~DRIVE MONITORING~~ SURROUND VIEW SYSTEM –

Part 3: Measurement methods

FOREWORD

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IEC 63033-3 has been prepared by technical area 17: Multimedia systems and equipment for vehicles, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2019. This edition constitutes a technical revision.

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a) updates to the text and the title to reflect the change of the scope of the IEC 63033 series.

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

Draft	Report on voting
100/3734/FDIS	100/3753/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 63033 series, published under the general title *Multimedia systems and equipment for vehicles – Surround view system*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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INTRODUCTION

This document specifies measurement methods for the ~~drive monitoring~~ surround view system specified in IEC ~~TS~~ 63033-1~~:2017~~, which also specifies the model for generating the surrounding visual image of a ~~drive monitoring~~ surround view system. The system allows drivers to monitor the car's perimeter in real time by using "free eye point" technology, which allows drivers to dynamically change the viewing perspective to obtain the most appropriate views according to the driving situation.

~~CAR~~ MULTIMEDIA SYSTEMS AND EQUIPMENT FOR VEHICLES – ~~DRIVE MONITORING~~ SURROUND VIEW SYSTEM –

Part 3: Measurement methods

1 Scope

This document specifies measurement methods for the ~~drive monitoring~~ surround view system specified in IEC ~~TS~~ 63033-1~~:2017~~.

2 Normative references

The following documents are referred to in the text in such a way that ~~any~~ 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 TS 63033-1:2017, *Car multimedia system and equipment – Drive monitoring system – Part 1: General*~~

IEC 63033-1:2022, *Multimedia systems and equipment for vehicles – Surround view system – Part 1: General*

ISO 16505:2019, *Road vehicles – Ergonomic and performance aspects of Camera Monitor Systems – Requirements and test procedures*

UN Regulation No. 46, *Uniform provisions concerning the approval of devices for indirect vision and of motor vehicles with regards to the installation of these devices*

UN Regulation No. 125, *Uniform provisions concerning the approval of motor vehicles with regards to the forward field of vision of the motor vehicle driver*

3 Terms, definitions and abbreviated terms

No terms and definitions are listed in this document.

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 Abbreviated terms

FOV field of view

4 System model

~~The system model of the drive monitoring system is described in Figure 1.~~ A ~~drive monitoring~~ surround view system shall generate multiple camera composite images and/or single camera images, using cameras that are mounted on the outside the car. The system model of the surround view system is described in Figure 1. The views to be generated by this system shall

capture the fields of view specified in Clause 7. This system shall generate multiple views according to the fields of view to be secured. For measurement methods, the system shall refer to ISO 16505 and UN Regulation No. 46. However, the system itself does not need to ~~fully~~ comply with ISO 16505 and UN Regulation No. 46.

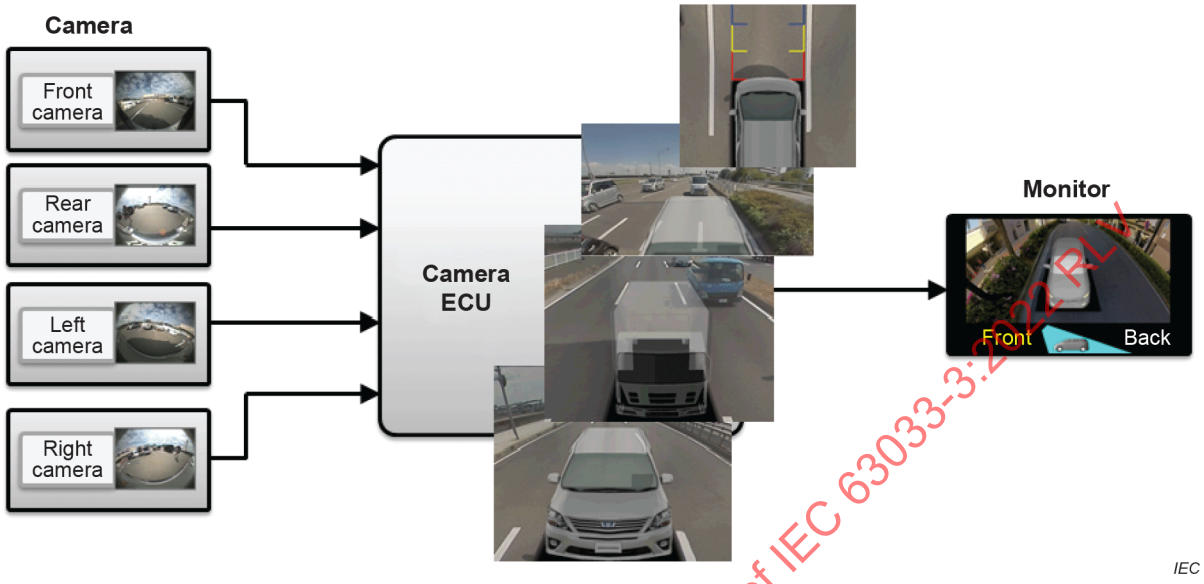


Figure 1 – System model of ~~drive monitoring~~ surround view system

5 Camera image quality

5.1 Camera resolution

The resolution of the camera shall be 300 000 pixels or more.

5.2 Camera image quality

The camera's image quality shall comply with ISO 16505:2019, 6.7, and shall be measured as specified in ISO 16505:2019, 7.8. The monitor's image quality shall comply with ISO 16505:2019, 6.7, and shall be measured as specified in ISO 16505:2019, 7.8, as well. For the measurement of the camera's image quality, a monitor satisfying the requirements in the previous sentence shall be used.

6 Camera calibration

6.1 General

The calibration of the camera shall be performed as specified in IEC ~~TS~~ 63033-1:~~2017~~2022, Annex C.

6.2 Verification

Draw an orthogonal frame at a distance of 1,5 m from the outline of the vehicle; this frame is to be captured within the camera's image. This frame is shown in Figure 2 and can be seen on the captured camera image. The guidance lines shown in Figure 3 representing the frame 1,5 m around the car's body that is later drawn on the composite video shall match up within a tolerance of 10 cm.

Dimension in metres

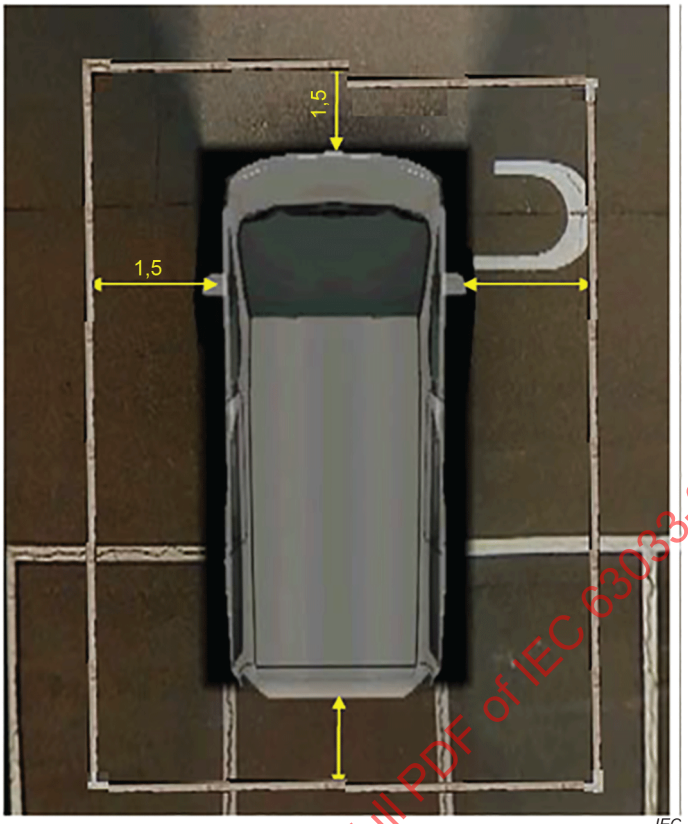


Figure 2 – Orthogonal reference

Dimension in metres

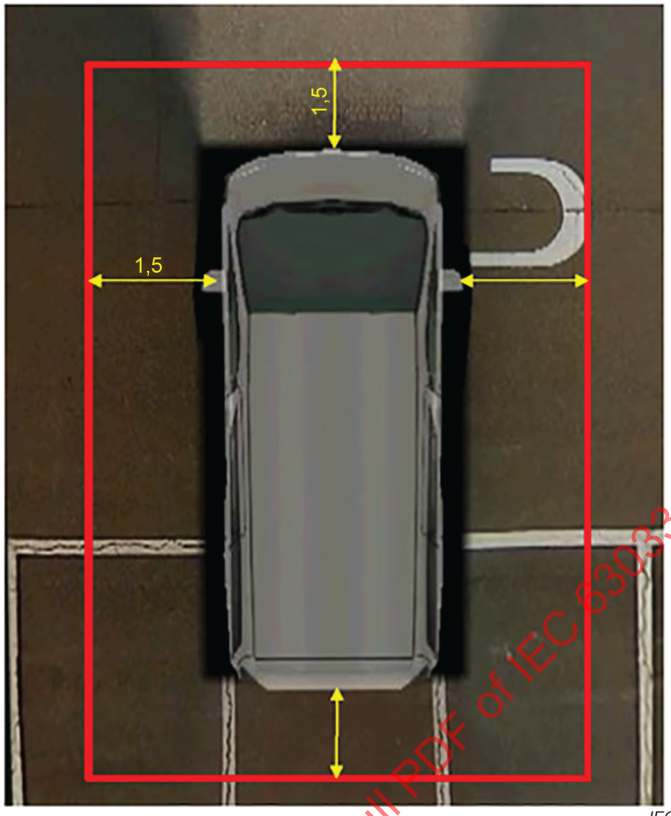


Figure 3 – Reference ~~guideline~~ guidance line

7 Field of view

The field of view of the system is the visible area displayed by composite images (i.e. from the multiple cameras composing the system) or the image captured by any single camera that is then converted and displayed. If the target of the application of this system is to replace an existing type approval that is required for vehicular equipment, it shall ~~comply with~~ follow the respective regulation. For example, the FOV shall capture the respective FOV defined in UN Regulations No. 46 and No. 125 (Class I to VI) if the system is intended to be used in such an application. ~~Some examples of views representing FOVs of Class I to VI is~~ The details are described in Annex A. The compulsory or optional FOV shall follow the requirement specified in the table under paragraph 15.2.1.1.1. in UN Regulation No. 46.

8 Time behaviour

8.1 Start-up time

The manufacturer of the camera ECU shall provide information of the start-up time of the system. The start-up time means the time from powering on the ignition to the initial composite view being displayed on the monitor. The start-up time shall be 7 s or less. The start-up time shall be measured as specified in ISO 16505:2019, 7.3.

8.2 Frame rate

The manufacturer of the camera ECU shall provide information on the frame rate of the system. The frame rate shall be more than ~~30 fps~~ 15 fps. ~~While manoeuvring at low speed, the frame rate can drop (e.g. owing to image processing) but shall be never be below 15 fps.~~ The frame rate shall be measured as specified in ISO 16505:2019, 7.9.1.

8.3 Latency

The camera's ECU should have a sufficiently short latency to render the image to display at nearly the same time as the camera image is captured. The latency is the time difference from when a light is captured by the camera until the time it becomes visible to the display. The latency shall be lower than 200 ms and shall be measured as specified in ISO 16505:2019, 7.9.3.

Annex A
(informative)

Field of view (FOV)

Figure A.1 to Figure A.8 provide some examples of views representing FOVs of class I to VI, a larger FOV on the passenger side, and also some example of views as specified within section 5.4.1 of UN Regulation No. 125, using an image generated by more than two cameras comprising a ~~drive monitoring~~ surround view system. However, the generated example views provided in this document do not necessarily comply with uniform provisions as described, for example, in the UN Regulation No. 46 or UN Regulation No. 125. For more details on what can be displayed and what cannot be displayed, it is strongly recommended to check the ~~applicable~~ existing regulations.

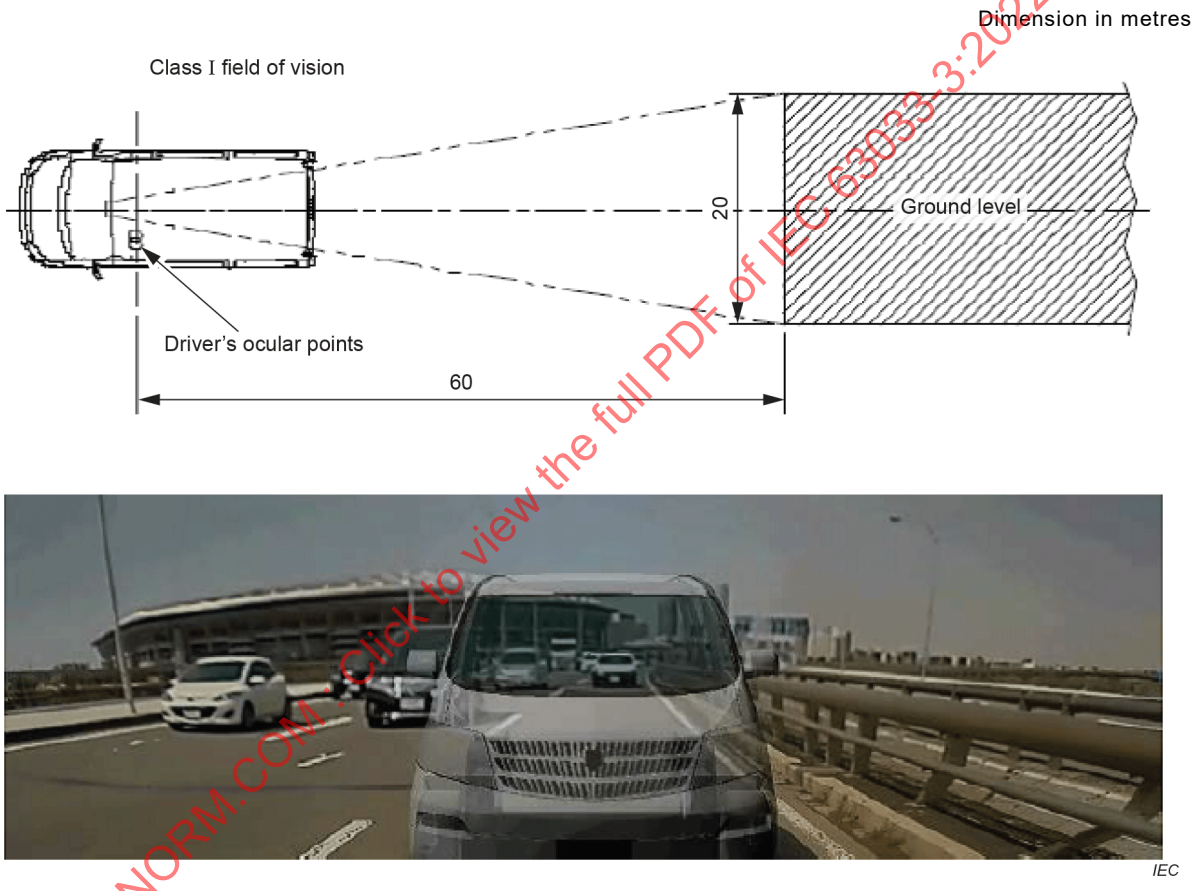


Figure A.1 – Example view for class I FOV

Dimension in metres

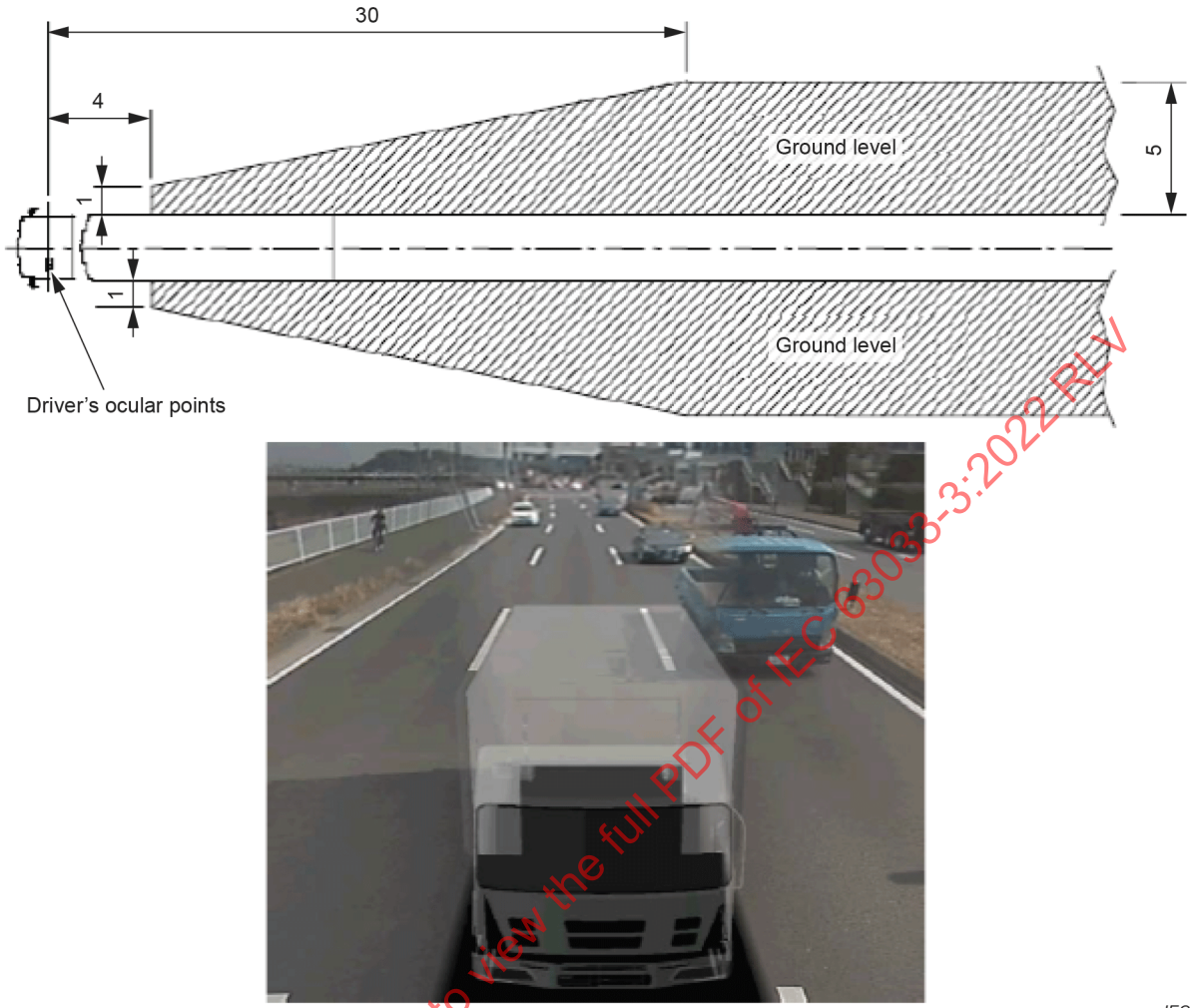


Figure A.2 – Example view for class II FOV

Dimension in metres

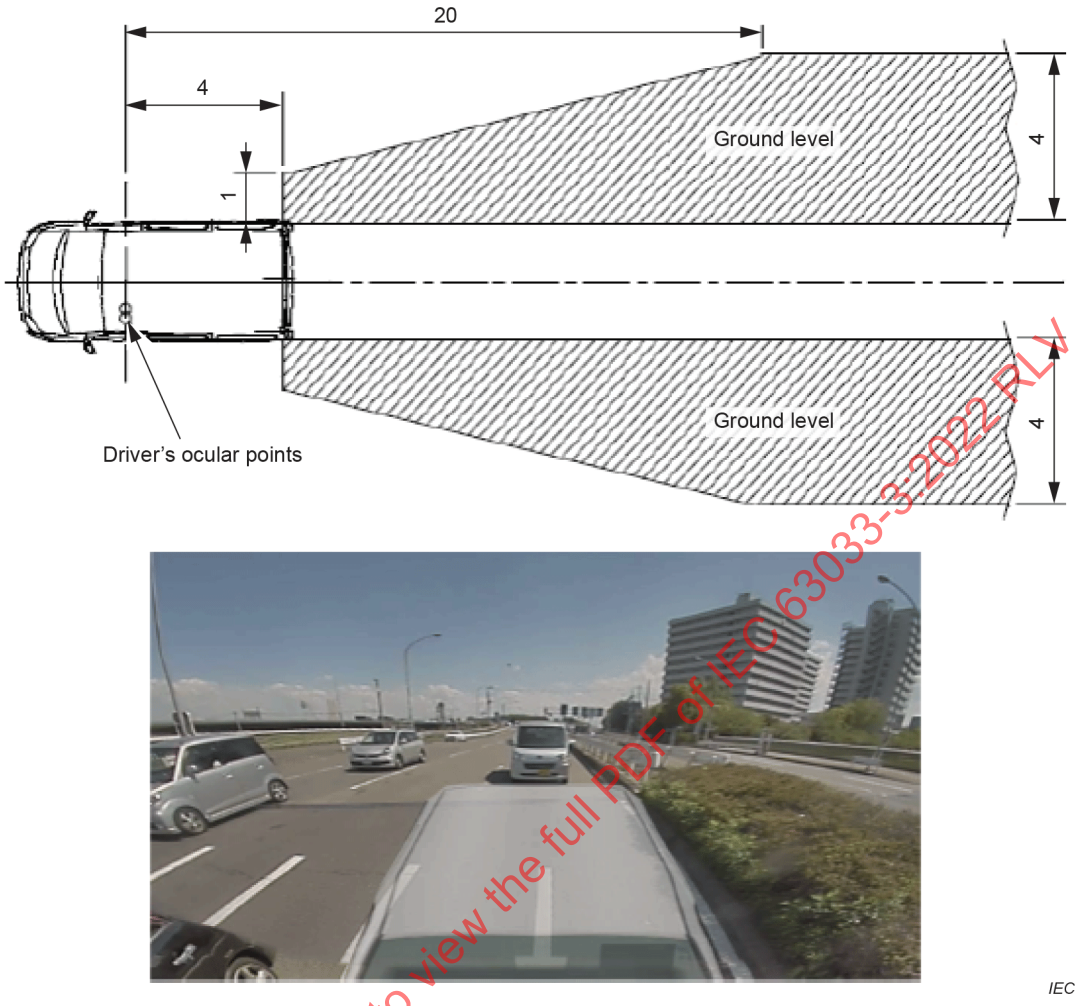


Figure A.3 – Example view for class III FOV

Dimension in metres

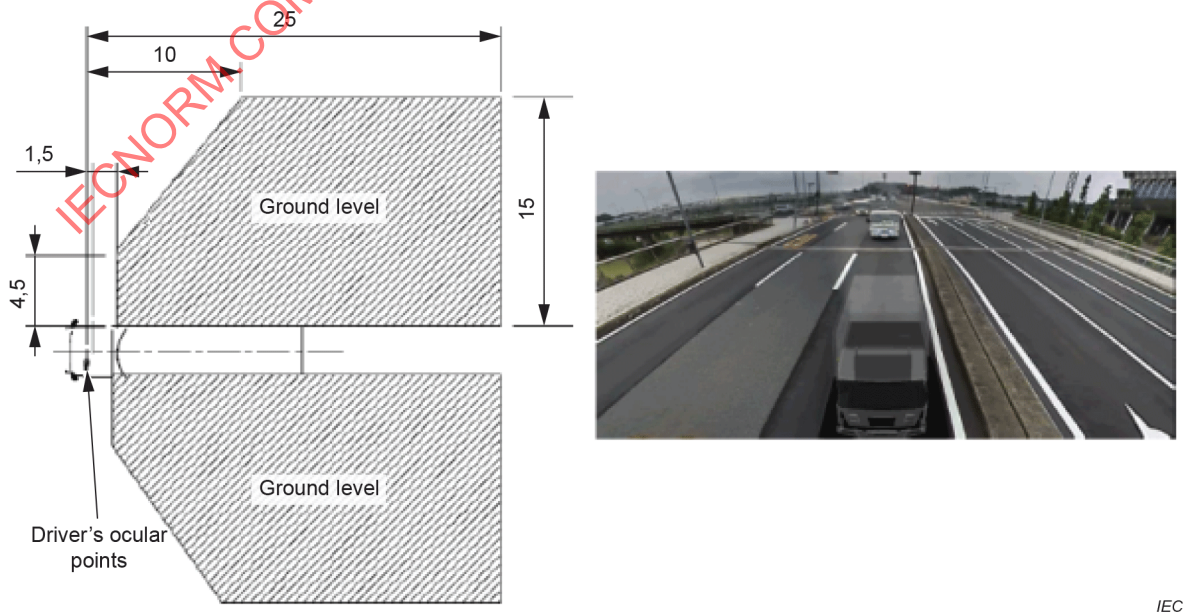


Figure A.4 – Example view for class IV FOV

Dimension in metres

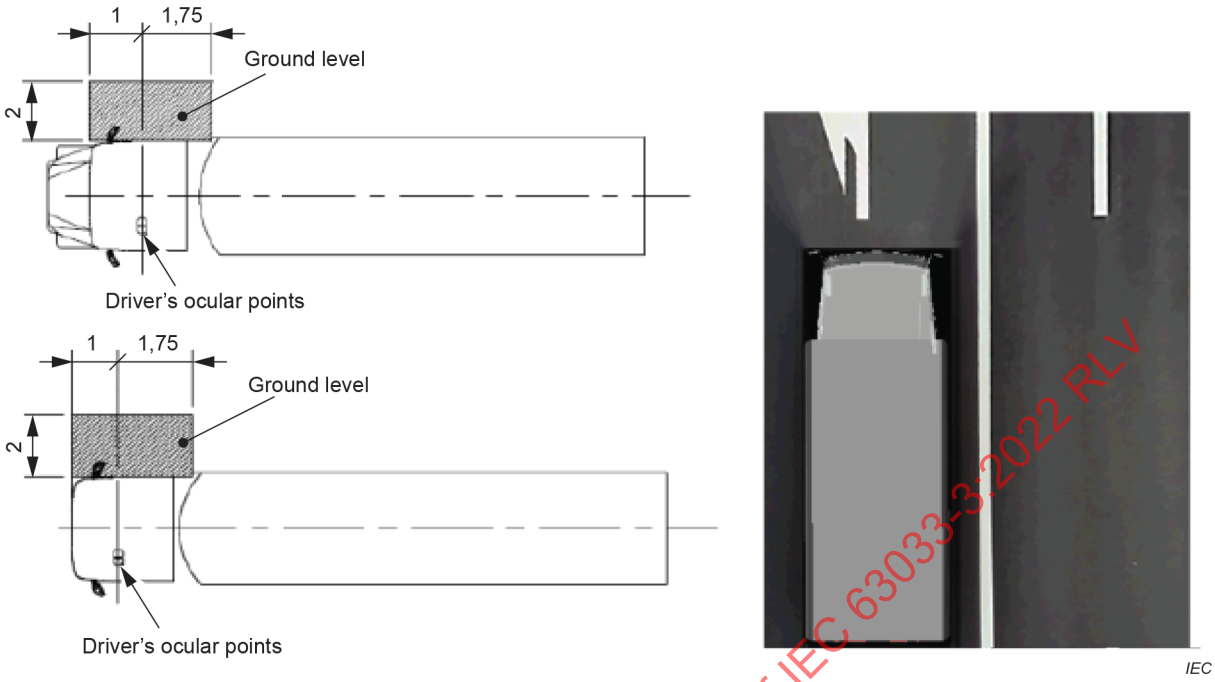


Figure A.5 – Example view for class V FOV

Dimension in metres

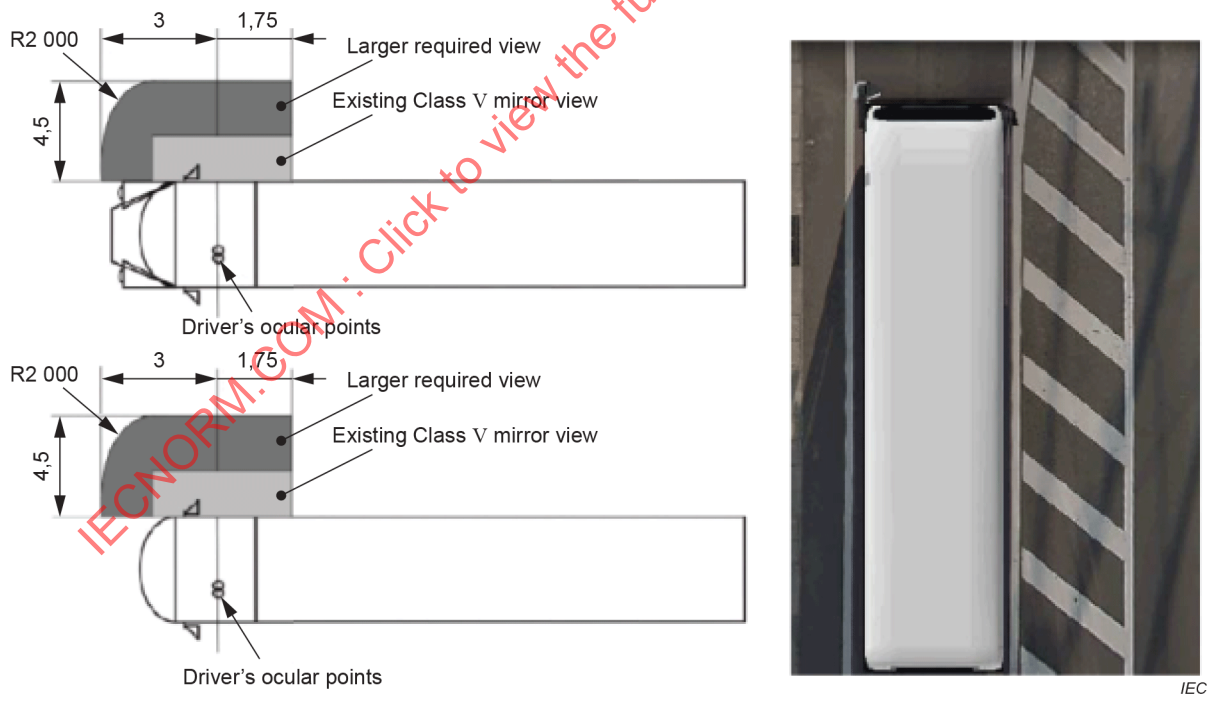
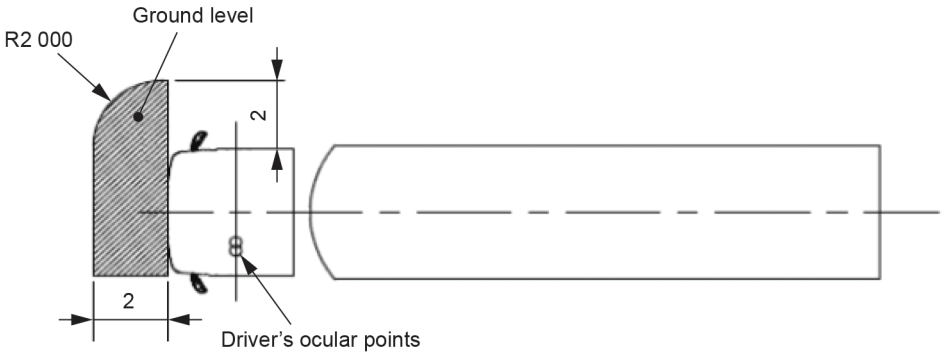


Figure A.6 – Example view for larger FOV on the passenger side

Dimension in metres



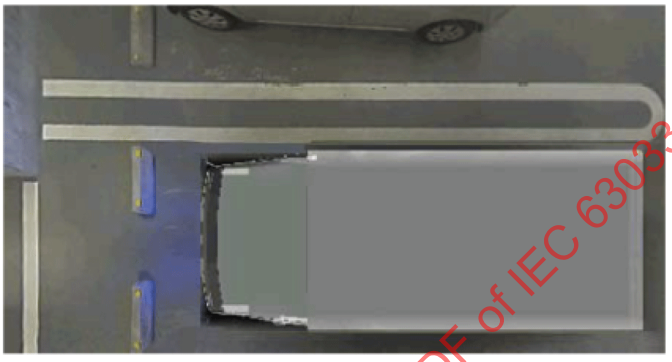


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Figure A.7 – Example view for class VI FOV

Dimension in millimetres

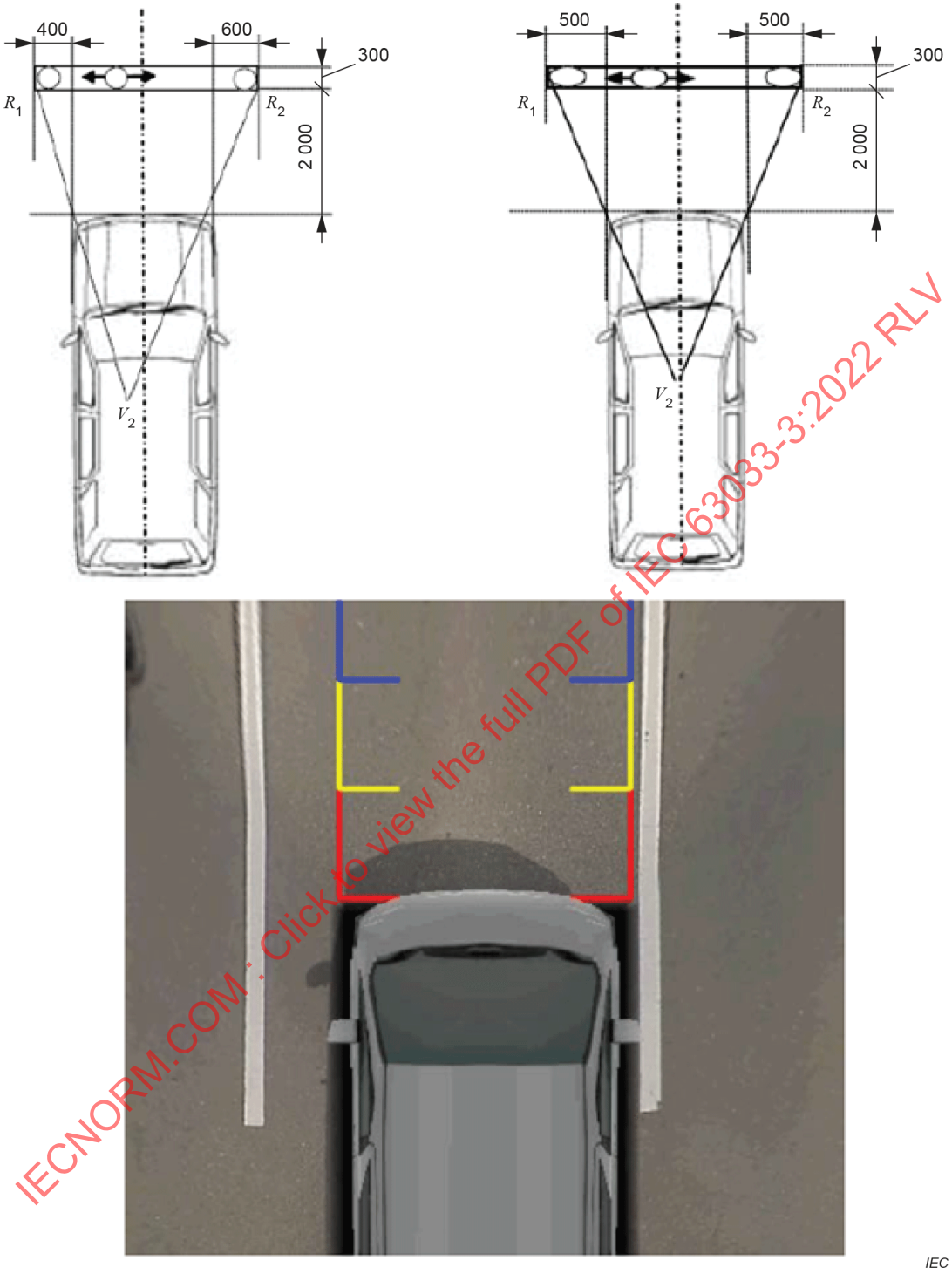

Figure A.8 – Example view for FOV defined in 5.4.1 of UN REGULATION No. 125

Bibliography

ISO 12233:~~2017~~2014, *Photography – Electronic still picture imaging – Resolution and spatial Frequency responses*

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Multimedia systems and equipment for vehicles – Surround view system – Part 3: Measurement methods

Systèmes et équipements multimédias pour véhicules – Système de vision panoramique –
Partie 3: Méthodes de mesurage

IEC 63033-3:2022-04(en-fr)

CONTENTS

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Part 3: Measurement methods

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MULTIMEDIA SYSTEMS AND EQUIPMENT FOR VEHICLES – SURROUND VIEW SYSTEM –

Part 3: Measurement methods

1 Scope

This document specifies measurement methods for the surround view system specified in IEC 63033-1.

2 Normative references

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3.1 Abbreviated terms

FOV field of view

4 System model

A surround view system shall generate multiple camera composite images and/or single camera images, using cameras that are mounted on the outside the car. The system model of the surround view system is described in Figure 1. The views to be generated by this system shall capture the fields of view specified in Clause 7. This system shall generate multiple views according to the fields of view to be secured. For measurement methods, the system shall refer to ISO 16505 and UN Regulation No. 46. However, the system itself does not need to comply with ISO 16505 and UN Regulation No. 46.

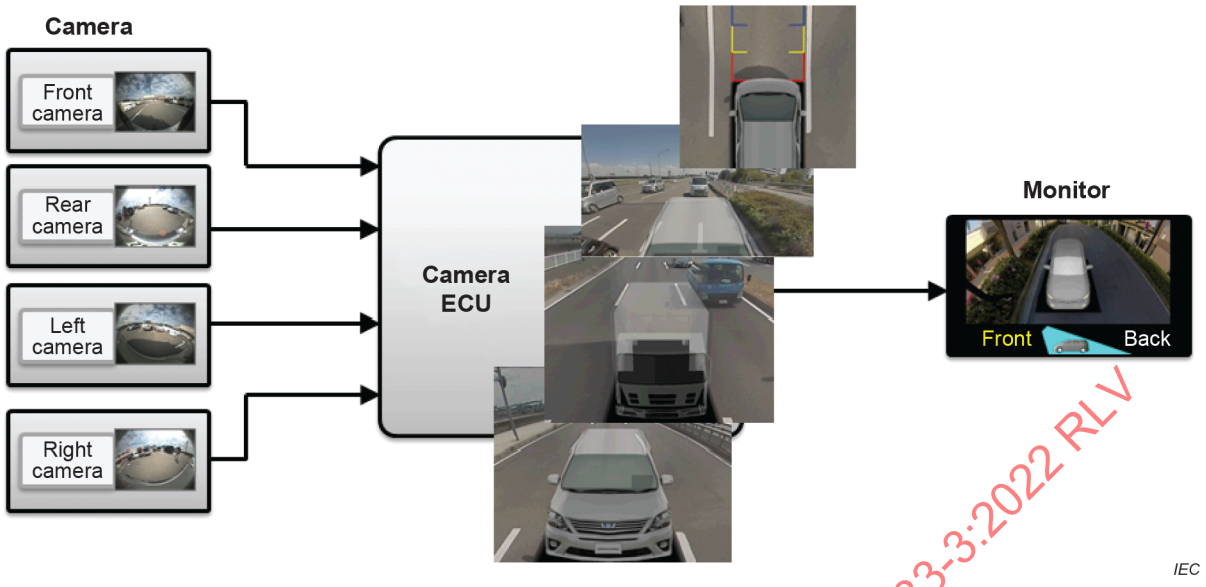

Figure 1 – System model of surround view system

5 Camera image quality

5.1 Camera resolution

The resolution of the camera shall be 300 000 pixels or more.

5.2 Camera image quality

The camera's image quality shall comply with ISO 16505:2019, 6.7, and shall be measured as specified in ISO 16505:2019, 7.8. The monitor's image quality shall comply with ISO 16505:2019, 6.7, and shall be measured as specified in ISO 16505:2019, 7.8, as well. For the measurement of the camera's image quality, a monitor satisfying the requirements in the previous sentence shall be used.

6 Camera calibration

6.1 General

The calibration of the camera shall be performed as specified in IEC 63033-1:2022, Annex C.

6.2 Verification

Draw an orthogonal frame at a distance of 1,5 m from the outline of the vehicle; this frame is to be captured within the camera's image. This frame is shown in Figure 2 and can be seen on the captured camera image. The guidance lines shown in Figure 3 representing the frame 1,5 m around the car's body that is later drawn on the composite video shall match up within a tolerance of 10 cm.

Dimension in metres

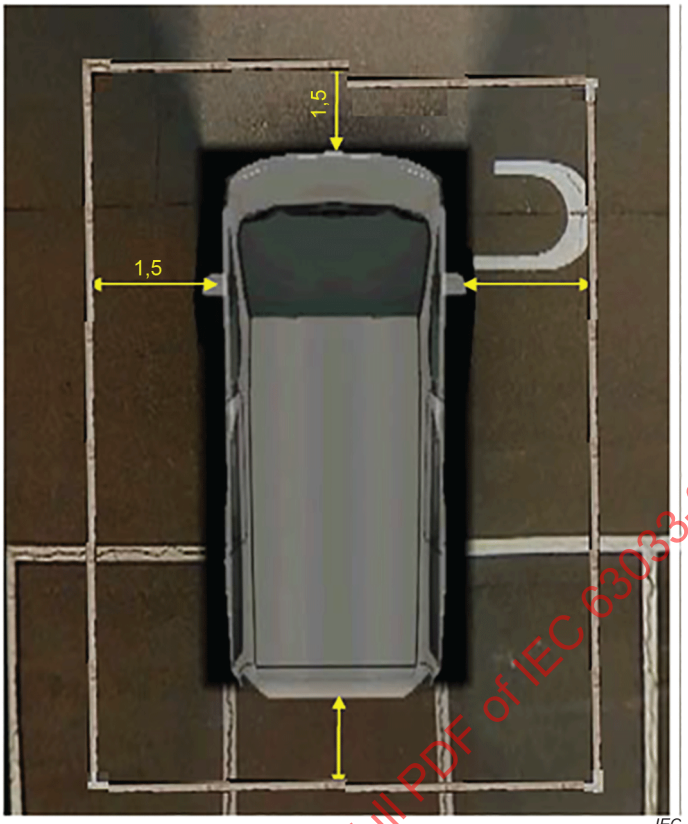

Figure 2 – Orthogonal reference

Dimension in metres

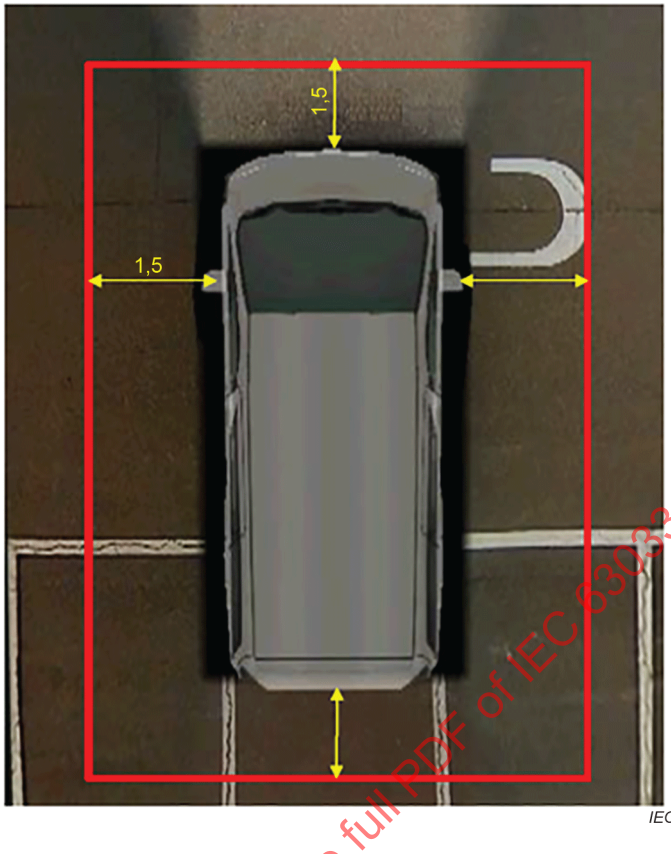

Figure 3 – Reference guidance lines

7 Field of view

The field of view of the system is the visible area displayed by composite images (i.e. from the multiple cameras composing the system) or the image captured by any single camera that is then converted and displayed. If the target of the application of this system is to replace an existing type approval that is required for vehicular equipment, it shall follow the respective regulation. For example, the FOV shall capture the respective FOV defined in UN Regulations No. 46 and No. 125 (Class I to VI) if the system is intended to be used in such an application. The details are described in Annex A. The compulsory or optional FOV shall follow the requirement specified in the table under paragraph 15.2.1.1.1. in UN Regulation No. 46.

8 Time behaviour

8.1 Start-up time

The manufacturer of the camera ECU shall provide information of the start-up time of the system. The start-up time means the time from powering on the ignition to the initial composite view being displayed on the monitor. The start-up time shall be 7 s or less. The start-up time shall be measured as specified in ISO 16505:2019, 7.3.

8.2 Frame rate

The manufacturer of the camera ECU shall provide information on the frame rate of the system. The frame rate shall be more than 15 fps. The frame rate shall be measured as specified in ISO 16505:2019, 7.9.1.

8.3 Latency

The camera's ECU should have a sufficiently short latency to render the image to display at nearly the same time as the camera image is captured. The latency is the time difference from when a light is captured by the camera until the time it becomes visible to the display. The latency shall be lower than 200 ms and shall be measured as specified in ISO 16505:2019, 7.9.3.

Annex A
(informative)

Field of view (FOV)

Figure A.1 to Figure A.8 provide some examples of views representing FOVs of class I to VI, a larger FOV on the passenger side, and also some example of views as specified within section 5.4.1 of UN Regulation No. 125, using an image generated by more than two cameras comprising a surround view system. However, the generated example views provided in this document do not necessarily comply with uniform provisions as described, for example, in the UN Regulation No. 46 or UN Regulation No. 125. For more details on what can be displayed and what cannot be displayed, it is strongly recommended to check the existing regulations.

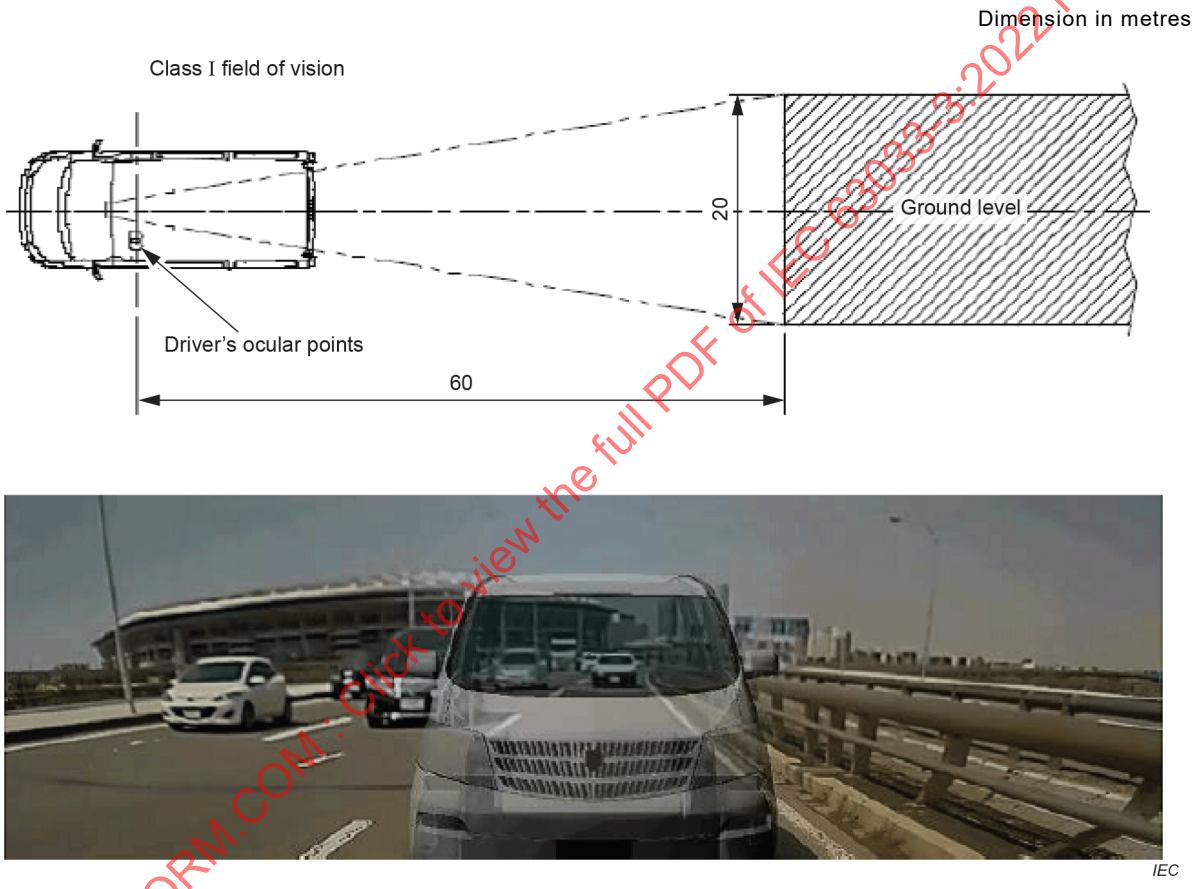

Figure A.1 – Example view for class I FOV

Dimension in metres

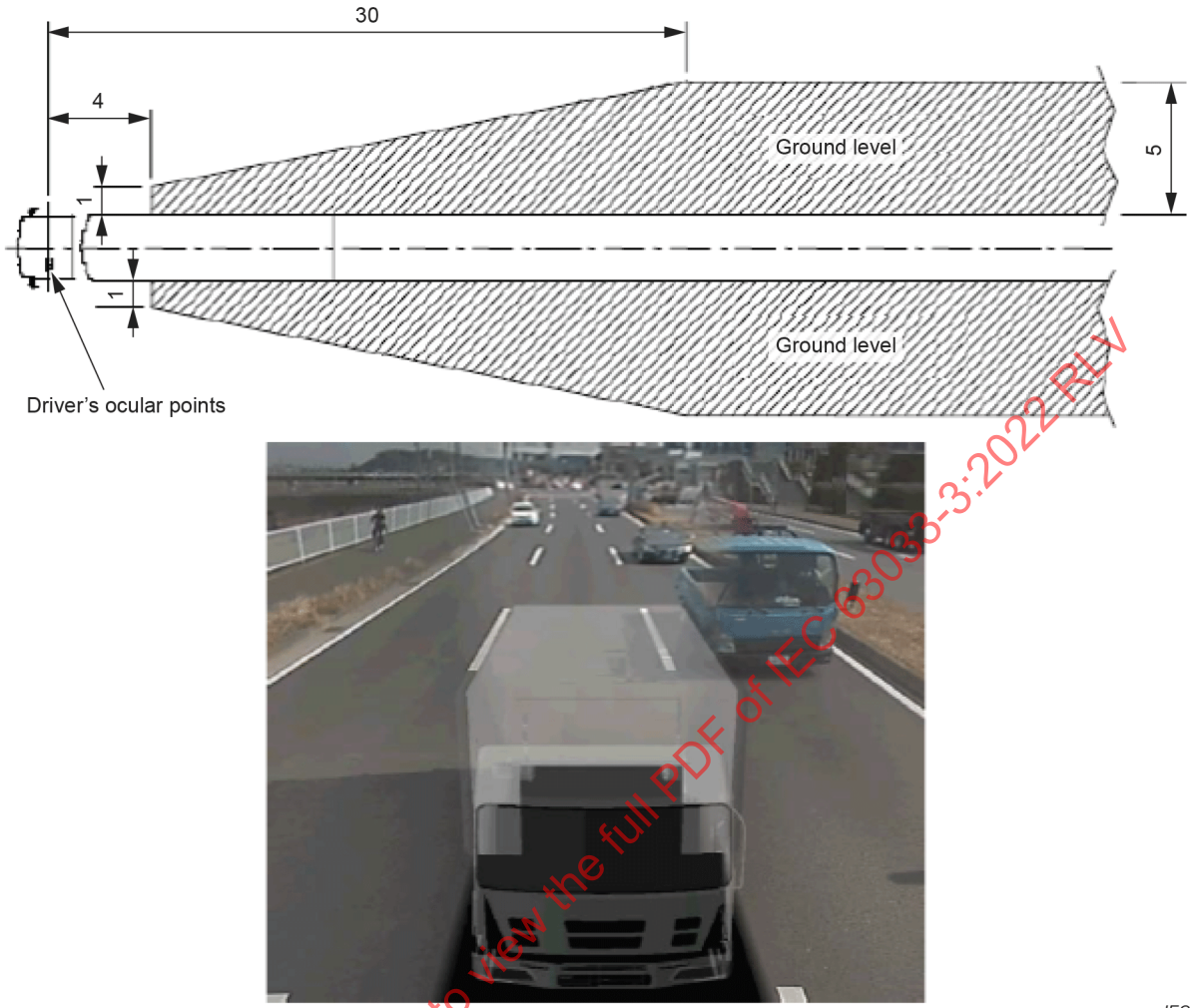

Figure A.2 – Example view for class II FOV

Dimension in metres

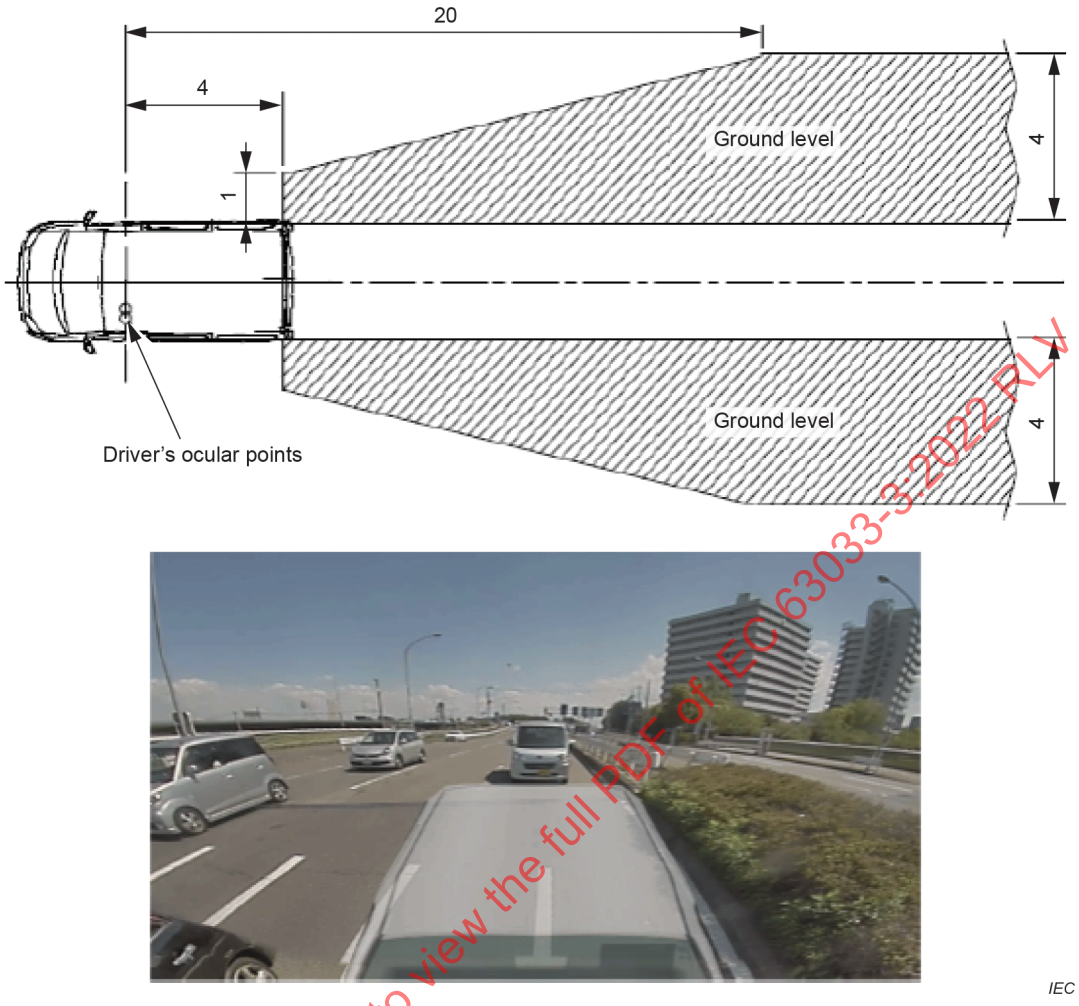

Figure A.3 – Example view for class III FOV

Dimension in metres

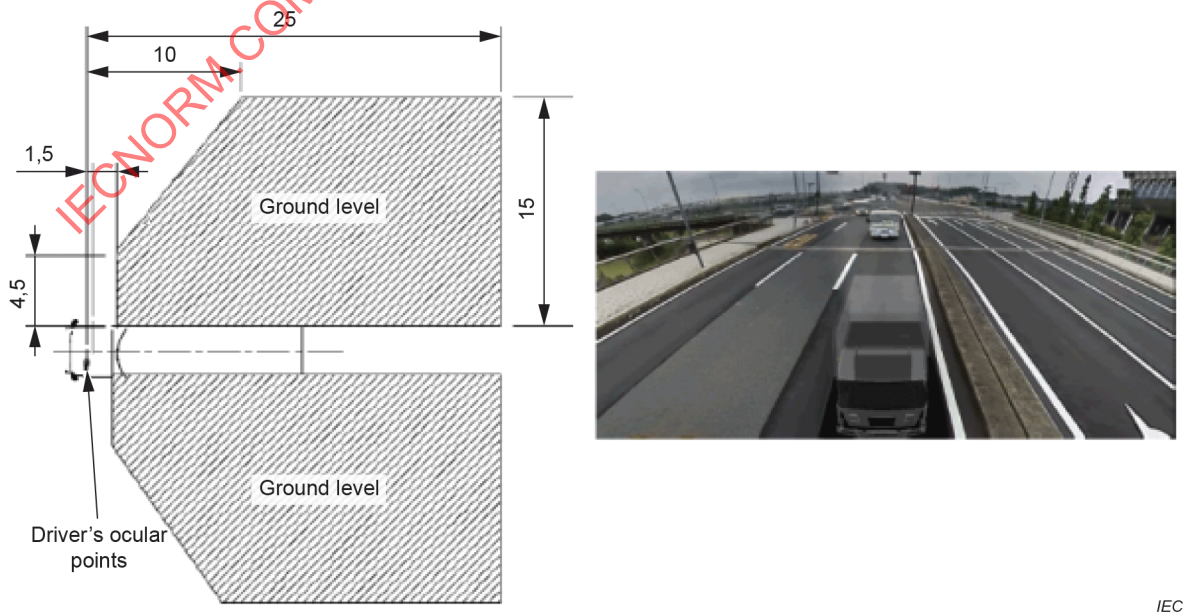

Figure A.4 – Example view for class IV FOV

Dimension in metres

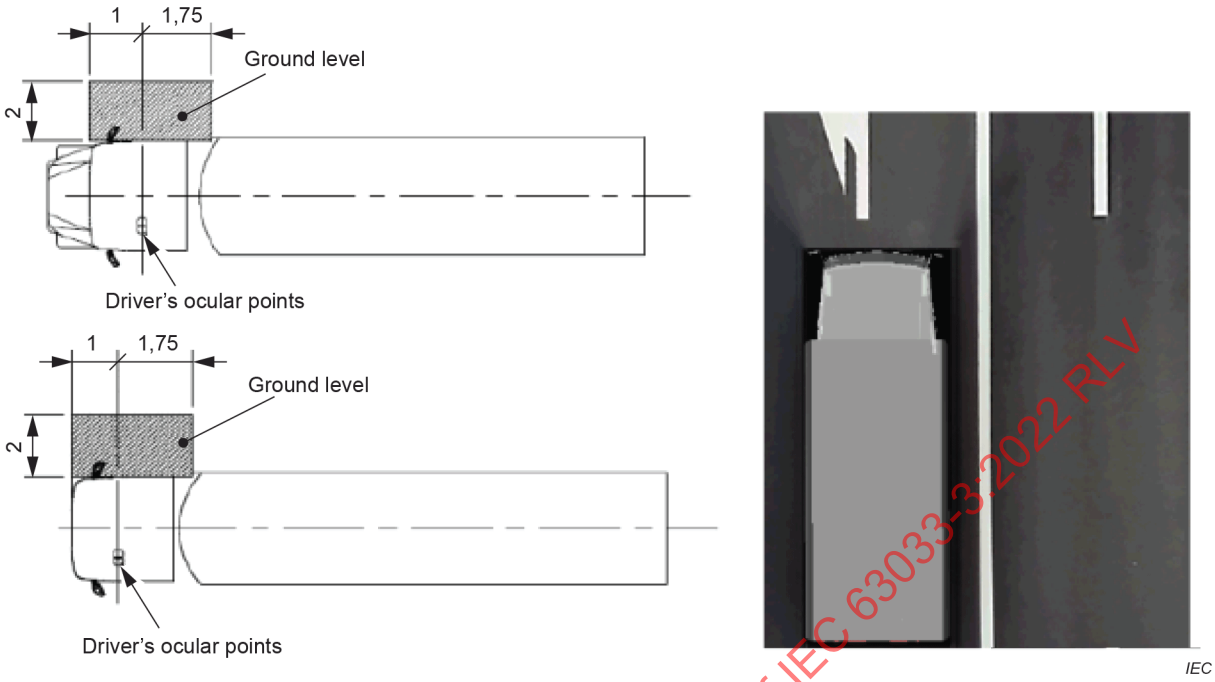

Figure A.5 – Example view for class V FOV

Dimension in metres

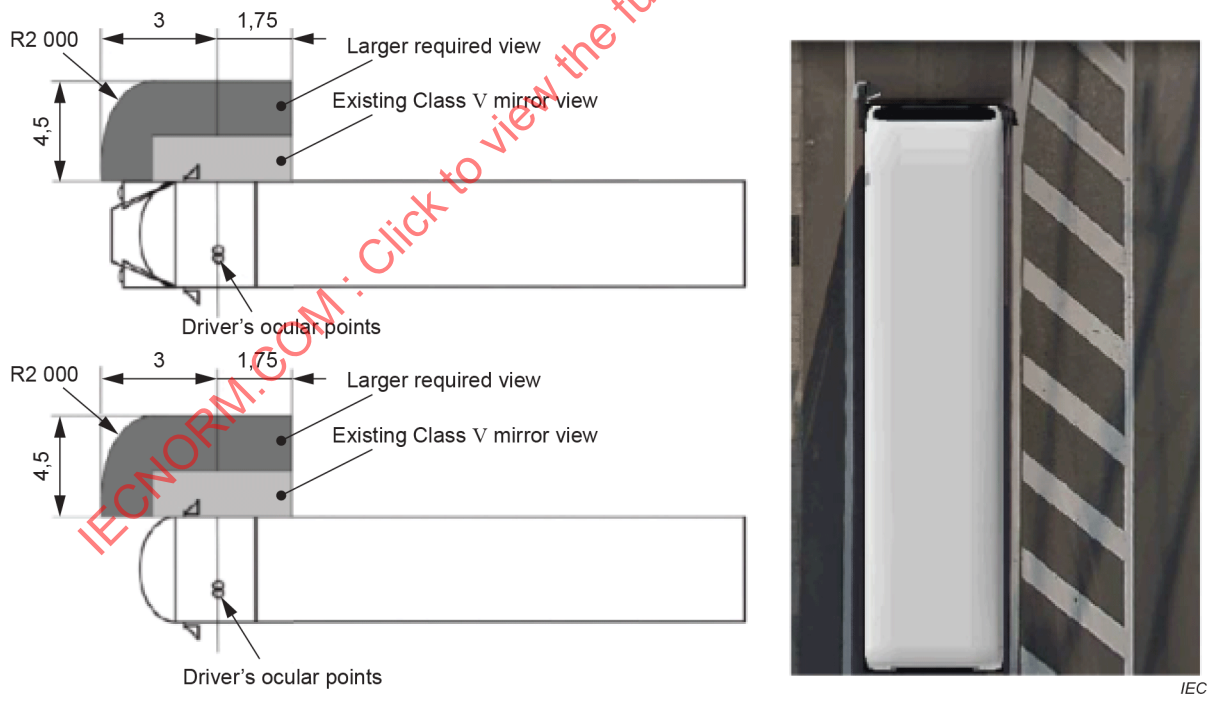

Figure A.6 – Example view for larger FOV on the passenger side

Dimension in metres

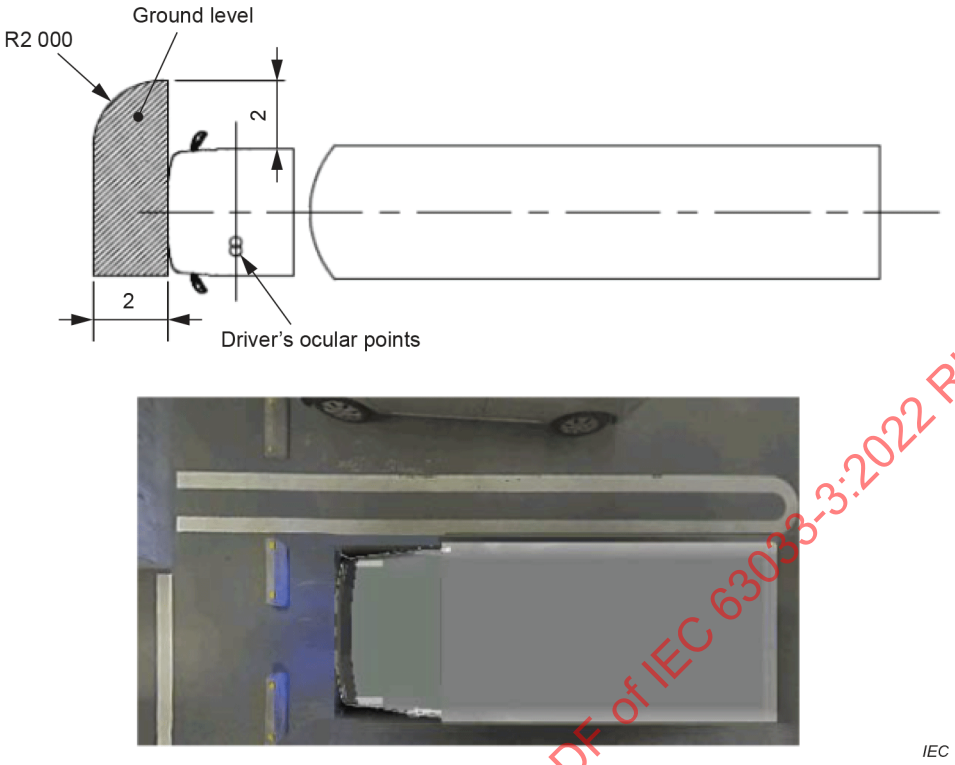

Figure A.7 – Example view for class VI FOV

Dimension in millimetres

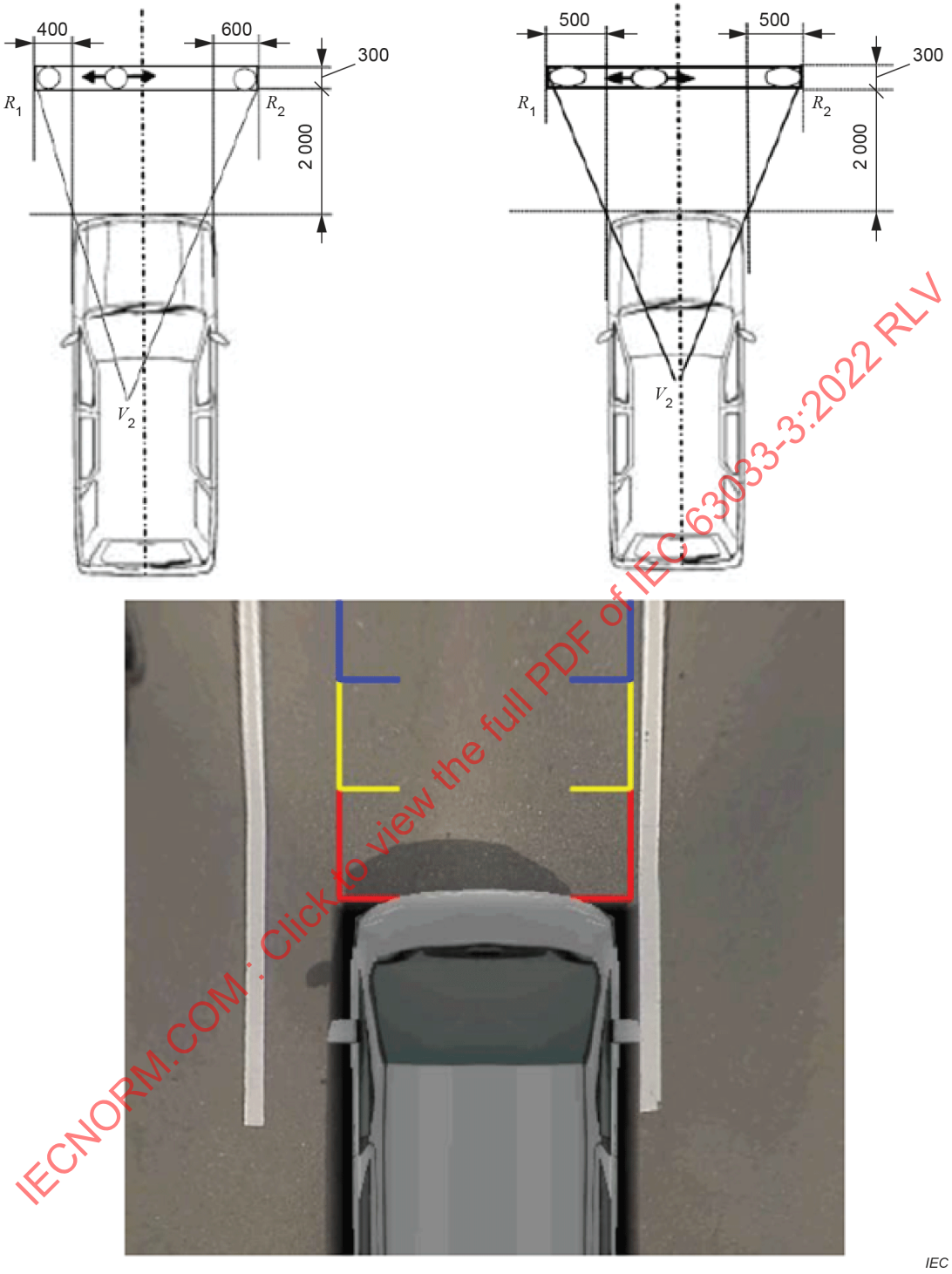

Figure A.8 – Example view for FOV defined in 5.4.1 of UN REGULATION No. 125

Bibliography

ISO 12233:2014, *Photography – Electronic still picture imaging – Resolution and spatial Frequency responses*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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SYSTÈMES ET ÉQUIPEMENTS MULTIMÉDIAS POUR VÉHICULES – SYSTÈME DE VISION PANORAMIQUE –

Partie 3: Méthodes de mesurage

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Cette seconde édition annule et remplace la première édition parue en 2019. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) mises à jour du texte et du titre afin de refléter la modification du domaine d'application de la série IEC 63033.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
100/3734/FDIS	100/3753/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Une liste de toutes les parties de la série IEC 63033, publiées sous le titre général *Systèmes et équipements multimédias pour véhicules – Système de vision panoramique*, se trouve sur le site web de l'IEC.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

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INTRODUCTION

Le présent document spécifie les méthodes de mesurage du système de vision panoramique spécifié dans l'IEC 63033-1, qui spécifie également le modèle utilisé pour générer l'image visuelle environnante du système de vision panoramique. Ce système permet aux conducteurs de surveiller le périmètre autour du véhicule en temps réel en utilisant la technologie "yeux libres", ce qui permet aux conducteurs de modifier de manière dynamique le point de vue afin d'obtenir les vues les plus appropriées en fonction de la situation de conduite.

SYSTÈMES ET ÉQUIPEMENTS MULTIMÉDIAS POUR VÉHICULES – SYSTÈME DE VISION PANORAMIQUE –

Partie 3: Méthodes de mesurage

1 Domaine d'application

Le présent document spécifie les méthodes de mesurage pour le système de vision panoramique spécifié dans l'IEC 63033-1.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 63033-1:2022, *Systèmes et équipements multimédias pour véhicules – Système de vision panoramique – Partie 1: Généralités*

ISO 16505:2019, *Véhicules routiers – Aspects ergonomiques et de performance des caméras embarquées – Exigences et procédures d'essai*

Règlement n° 46 de l'ONU, *Prescriptions uniformes relatives à l'homologation des systèmes de vision indirecte et des véhicules à moteur en ce qui concerne le montage de ces systèmes*

Règlement n° 125 de l'ONU, *Prescriptions uniformes relatives à l'homologation des véhicules à moteur en ce qui concerne le champ de vision du conducteur des véhicules à moteur*

3 Termes, définitions et termes abrégés

Aucun terme n'est défini dans le présent document.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse http://www.electropedia.org/
- ISO Online browsing platform: disponible à l'adresse http://www.iso.org/obp

3.1 Abréviations

CDV champ de vision

4 Modèle du système

Le système de vision panoramique doit générer les images composites de plusieurs caméras et/ou les images d'une seule caméra, en utilisant des caméras montées à l'extérieur du véhicule. La Figure 1 représente le modèle du système de vision panoramique. Les vues à générer par ce système doivent capturer les champs de vision spécifiés à l'Article 7. Ce système doit générer plusieurs vues en fonction des champs de vision à assurer. Pour les méthodes de mesurage, le système doit se référer à l'ISO 16505 et au Règlement n° 46 de l'ONU. Toutefois, il n'est pas nécessaire que le système lui-même soit conforme à l'ISO 16505 et au Règlement n° 46 de l'ONU.

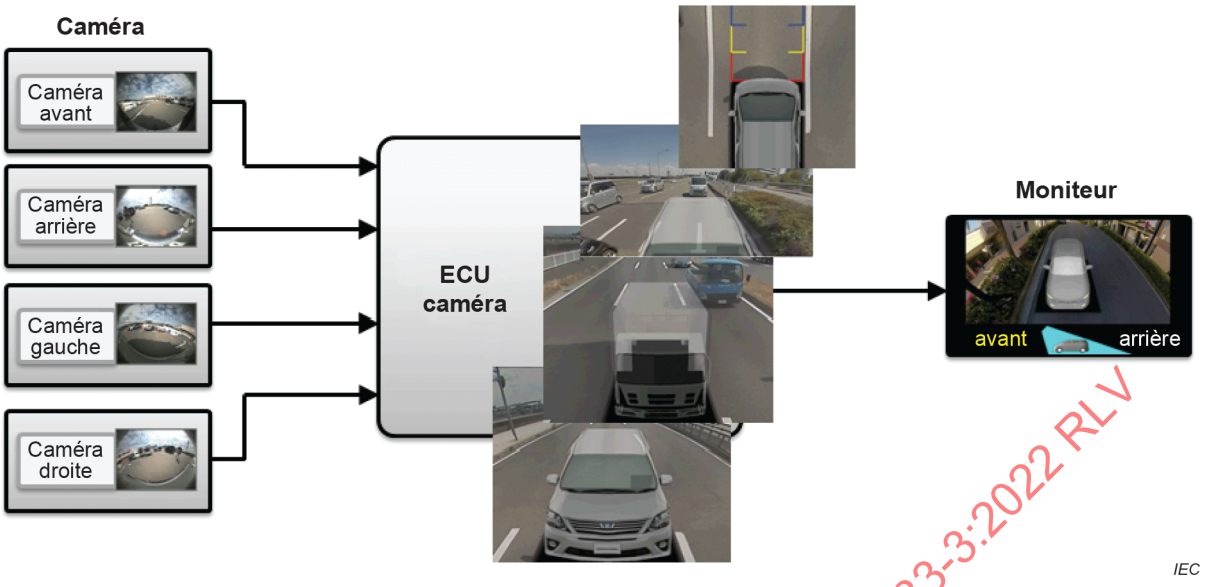

Figure 1 – Modèle du système de vision panoramique

5 Qualité d'image de la caméra

5.1 Résolution de la caméra

La résolution de la caméra doit être supérieure ou égale à 300 000 pixels.

5.2 Qualité d'image de la caméra

La qualité d'image de la caméra doit être conforme au 6.7 de l'ISO 16505:2019 et doit être mesurée comme cela est spécifié en 7.8 de l'ISO 16505:2019. La qualité d'image du moniteur doit être conforme au 6.7 de l'ISO 16505:2019 et doit être mesurée comme cela est spécifié en 7.8 l'ISO 16505:2019. Pour les mesurages de la qualité d'image de la caméra, un moniteur qui satisfait aux exigences de la précédente phrase doit être utilisé.

6 Etalonnage de la caméra

6.1 Généralités

La caméra doit être étalonnée comme cela est spécifié à l'Annexe C de l'IEC 63033-1:2022.

6.2 Vérification

Tracer un cadre orthogonal à une distance de 1,5 m du contour du véhicule; ce cadre doit être capturé dans l'image de la caméra. Ce cadre est représenté à la Figure 2 et peut être visualisé sur l'image capturée par la caméra. Le gabarit indiqué à la Figure 3 qui représente le cadre situé à 1,5 m autour de la carrosserie du véhicule et qui est ultérieurement affiché sur la vidéo composite doit correspondre avec une tolérance de 10 cm.

Dimension en mètres

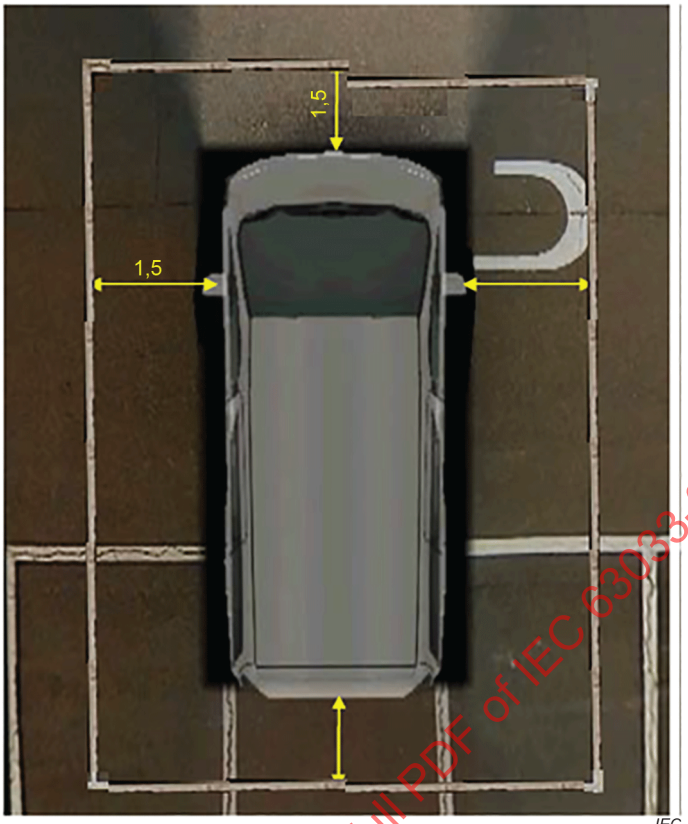

Figure 2 – Référence orthogonale