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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Eighty-third session**

Geneva, 19–23 October 2020

Item 5 of the provisional agenda

Regulations Nos. 37 (Filament lamps), 99 (Gas discharge light sources), 128 (Light emitting diodes light sources) and the Consolidated Resolution on the common specification of light source categories

Proposal for amendment to the Consolidated Resolution on the common specification of light source categories**Submitted by the expert from the International Automotive Lighting and Light-Signalling Expert Group***

The text reproduced below was prepared by the expert from the International Automotive Lighting and Light-Signalling Expert Group (GTB) with the aim to amend the Consolidated Resolution on the common specification of light source categories (R.E.5). There are no associated amendments to UN Regulations Nos. 37, 99 or 128. The modifications to the existing text of the Resolution are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

The Status table, amend to read:

"Status table

This consolidated version of this Resolution contains all provisions and amendments adopted so far by the World Forum for Harmonization of Vehicle Regulations (WP.29) and is valid from the date as indicated in the following table until the date on which the next revision of this Resolution becomes valid:

Version of the Resolution	Date * as from which the version is valid	Adopted by WP.29		Clarification
		Session No.	Amendment document No.	
1 (Original)	[2017-xx-xx]	170	ECE/TRANS/WP.29/2016/111	Based upon Annexes 1 of UN Regulations: <ul style="list-style-type: none"> No. 37, up to and including Supplement 44 No. 99, up to and including Supplement 11 No. 128, up to and including Supplement 5
[x]	[2021-xx-xx]	[18x]	[ECE/TRANS/WP.29/2021/xx]	<p>Amended details concerning measuring luminous flux and internal shield in paragraph 3.1, and sheets H4/2, H15/1, H15/5, H17/1, H17/6, H19/1, H19/5, HS1/2</p> <p>Amend the definition for light centre and associated amended detail in sheet LR4/2</p> <p>Introduction of use restriction for LED light source categories LW2, LW3, and LW5</p> <p>Amended detail in filament light source sheets H7/3, H8/3, H11/3, H14/2, H16/3, H18/3, H19/2, H20/3, H27W/1, P21/5W/2, S1/S2/1 and WY21W/1</p> <p>Amended detail in LED light source sheets L1/2, L1/4, L1/5, LR1/2, LR1/4, LW2/1, Lx3/1, Lx3/2, Lx3/5, LR4/1, LR4/2, LR4/4, Lx5/1, Lx5/2 and Lx5/5</p>

* This date is the date of adoption of the amendment to the Resolution by WP.29 or the date of entering into force of an amendment to UN Regulation No. 37, 99 or 128 adopted by AC.1 as a package with the amendment to the Resolution in the same session of WP.29.

”

Paragraph 2.2.3., amend to read:

“2.2.3. "Light centre" means a point that represents the **apparent (virtual)** origin of the light emitted.”

Paragraph 3.1., note *, amend to read:

“* Tables, Electrical and Photometric characteristics:

Voltage is expressed in V;

Wattage is expressed in W;

Luminous flux is expressed in lm.

In a case of a category of filament light source where more than one value of reference luminous flux is specified, the value at approximately 12 V **or 13.2 V** for a lighting device and 13.5 V for a light-signalling device shall be applied unless otherwise specified by the regulation used for the device. ”

Paragraph 3.1., notes *⁴ and *⁵, amend to read:

“*4 Not for use in UN Regulation No. 112 headlamps **and not for use in headlamps of Class A and Class B of UN Regulation No. 149.**

*5 Not for use in headlamps other than UN Regulation No. 113 class C **and UN Regulation No. 149 Class CS** headlamps.”

Paragraph 3.3., Group 2, amend to read:

“

Group 2				
LED light source categories only for use in signalling lamps, cornering lamps, reversing lamps and rear registration plate lamps:				
	Category		Sheet number(s)	
	LR1		LR1/1 to 5	
	LW2	2	LW2/1 to 5	
	LR3A		L3/1 to 6	
	LR3B		L3/1 to 6	
	LW3A	2	L3/1 to 6	
	LW3B	2	L3/1 to 6	
	LY3A		L3/1 to 6	
	LY3B		L3/1 to 6	
	LR4A		LR4/1 to 5	
	LR4B		LR4/1 to 5	
	LR5A		L5/1 to 6	
	LR5B		L5/1 to 6	
	LW5A	2	L5/1 to 6	
	LW5B	2	L5/1 to 6	
	LY5A		L5/1 to 6	
	LY5B		L5/1 to 6	

¹ Not for use in conformity of production control of lamps.

² **Not for use behind red and amber lenses”**

Annex I,

Sheet H4/2, table, amend to read:

“

Dimensions in mm	Filament light sources of normal production				Standard filament light source		
	12 V		24 V		12 V		
e	28.5 +0.35/-0.25		29.0 ± 0.35		28.5 + 0.20 / -0.00		
p	28.95		29.25		28.95		
α	max. 40°				max. 40°		
Cap P43t in accordance with IEC Publication 60061 (sheet 7004-39-6)							
Electrical and photometric characteristics							
Rated values	Volts	12 ^{6/}		24 ^{6/}		12 ^{6/}	
	Watts	60	55	75	70	60	55
Test voltage	Volts	13.2		28.0		13.2	

Dimensions in mm		Filament light sources of normal production				Standard filament light source	
		12 V		24 V		12 V	
Objective values	Watts	75 max.	68 max.	85 max.	80 max.	75 max.	68 max.
	Luminous flux	1,650	1,000	1,900	1,200		
	± %	15					
Measuring flux ^{7/} lm		-	750 1,000	-	800 1,200		
Reference luminous flux at approximately				12 V		1,250	750
				13.2 V		1,650	1,000

”

Sheet H7/3, table, amend to read:

“ ...

Dimensions in mm		Filament light sources of normal production		Standard filament light source
		12 V	24 V	12 V
...	
...	
g ^{12/}		0.5 min.		u.e. 0.5 min.
...	

”

Sheet H8/3, table, amend to read:

“ ...

Dimensions in mm		Filament light sources of normal production	Standard filament light source
		12 V	12 V
...	
...	
g		0.5 min.	u.e. 0.5 min.
...	

”

Sheet H11/3, table, amend to read:

“ ...

Dimensions in mm		Filament light sources of normal production		Standard filament light source
		12 V	24 V	12 V
...	
...	
g		0.5 min.		u.e. 0.5 min.
...	

”

Sheet H14/2, figures 3, 4 and 5, amend to read:

“

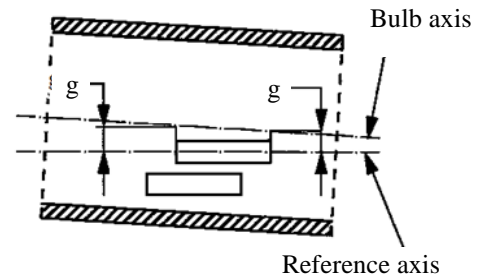
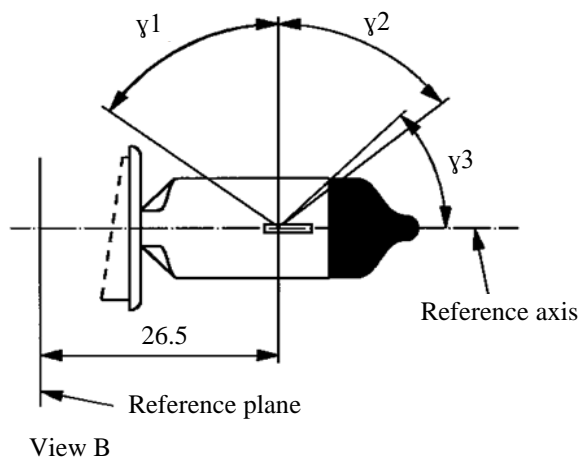


Figure 3 – Distortion free area^{4/} and black top^{5/}

Figure 4 – Bulb eccentricity^{6/}

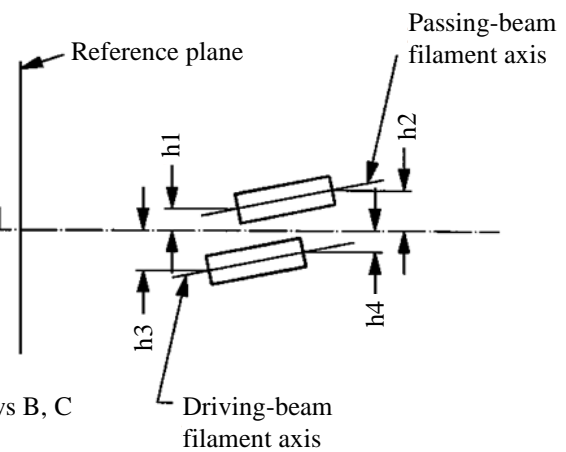
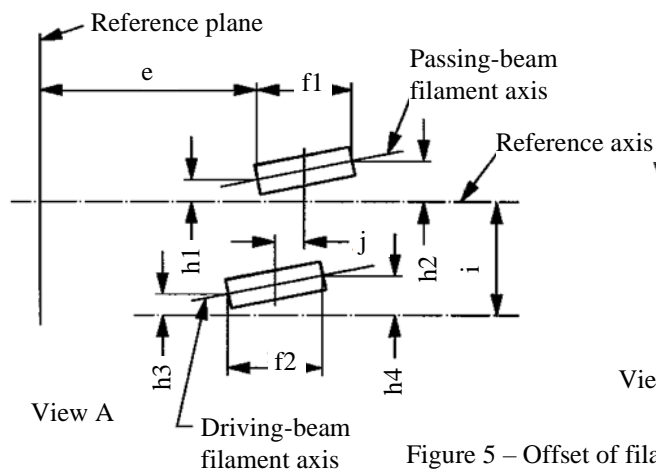


Figure 5 – Offset of filament axis^{7/}
(for standard filament light sources only)

”

Sheet H15/1, figure 1, amend to read (insert an arrow to the inner shield labelled with a footnote 14):

“

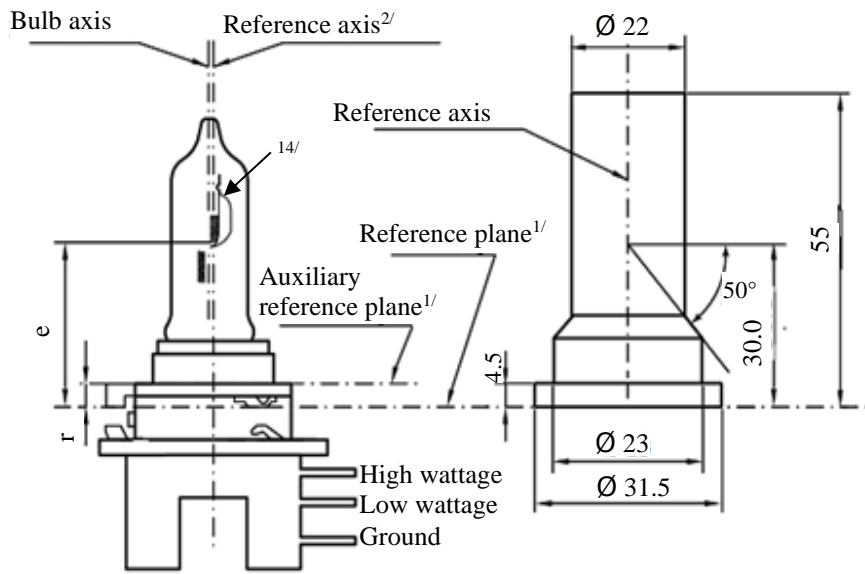


Figure 1 – Main drawing

Figure 3 - Maximum filament light source outlines^{3/}

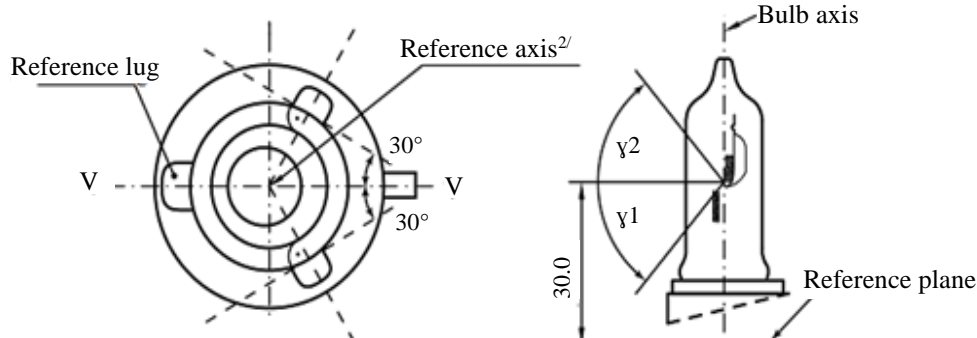


Figure 2 – Definition of reference axis^{7/}

Figure 4 - Distortion free area^{4/}

”

Sheet H15/5, insert a new footnote 14:

“ ...

14/ Internal shield, not intended for producing the cut-off-line.”

Sheet H16/3, table, amend to read:

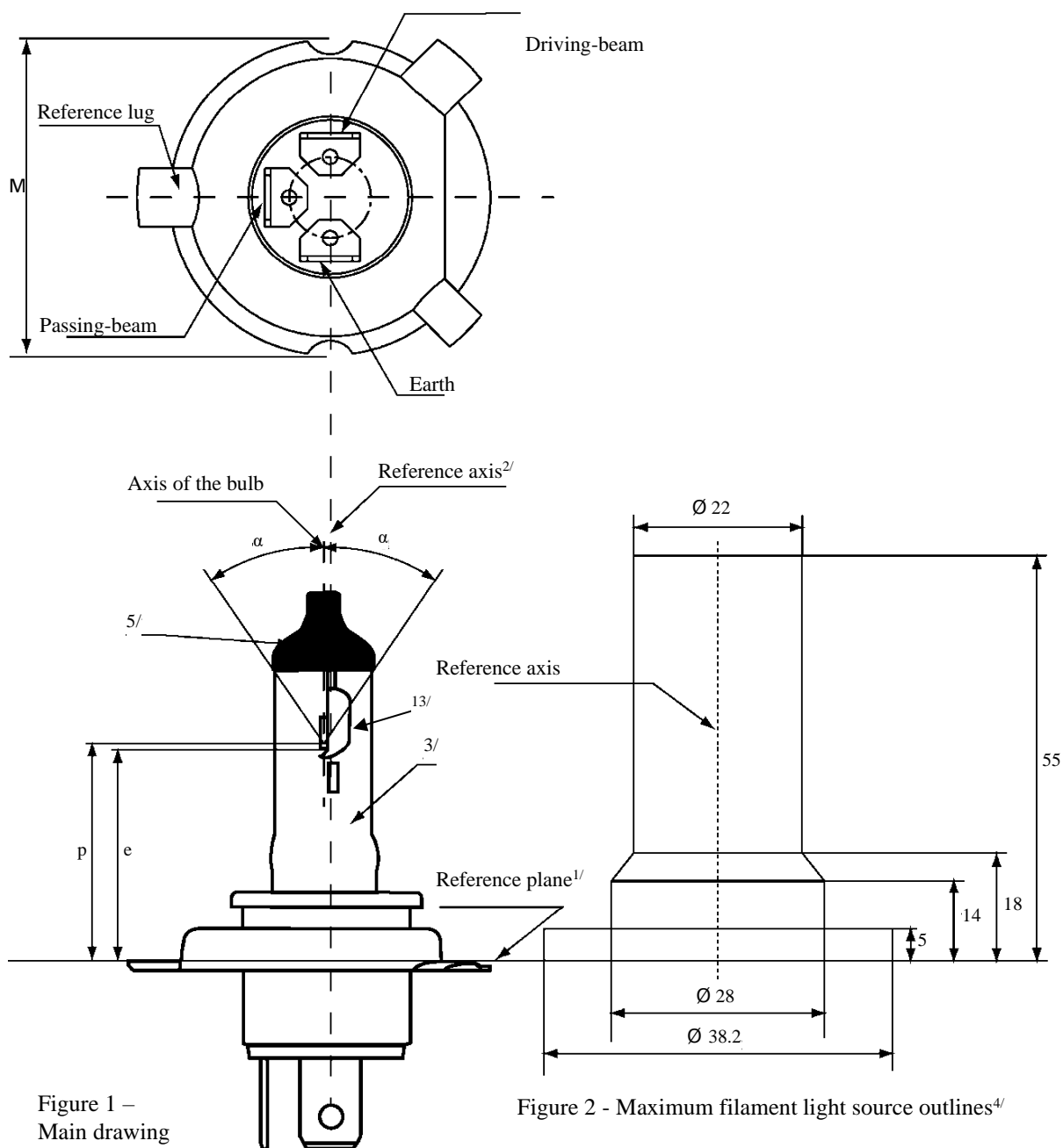
“ ...

Dimensions in mm	Filament light sources of normal production	Standard filament light source
	12 V	12 V
...
...
g	0.5 min.	± 0.5 min.
...

”

Sheet H17/1, figure 1, amend to read (insert an arrow to the inner shield labelled with a new footnote 13):

“



"

Sheet H17/6, insert a new footnote 13:

“ . . .

^{13/} Internal shield, not intended for producing the cut-off-line.”

Sheet H18/3, table, amend to read:

“...

	<i>Filaments light sources of normal production</i>	<i>Standard filament light source</i>
	<i>12 V</i>	<i>12 V</i>

...
...
g ^{12/}	0.5 min.	±e 0.5 min.
...

”

Sheet H19/1, figure 1, amend to read insert an arrow to the inner shield labelled with a new footnote 13):

“

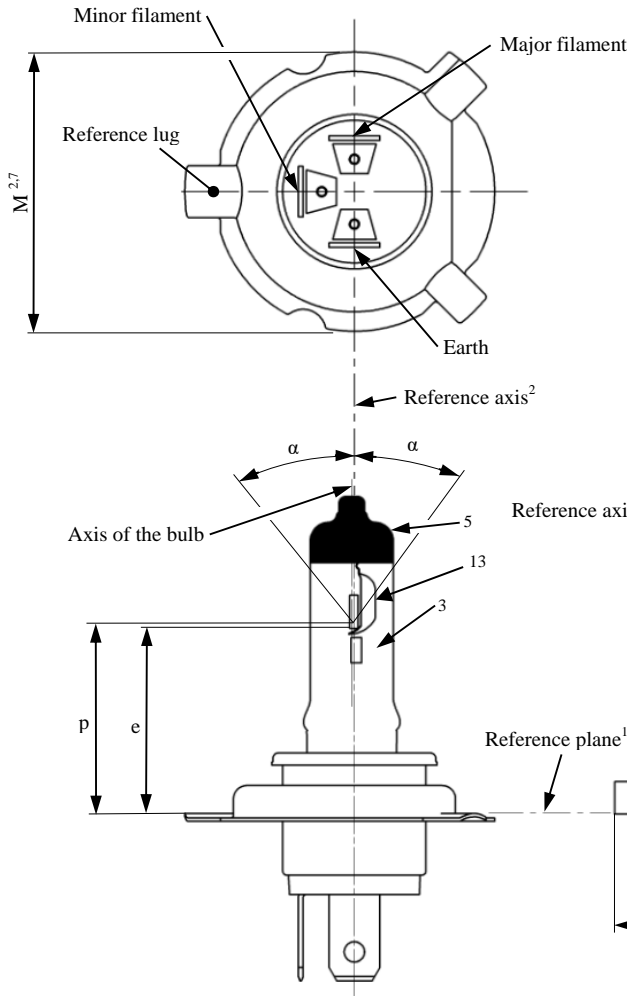


Figure 1
Main drawing

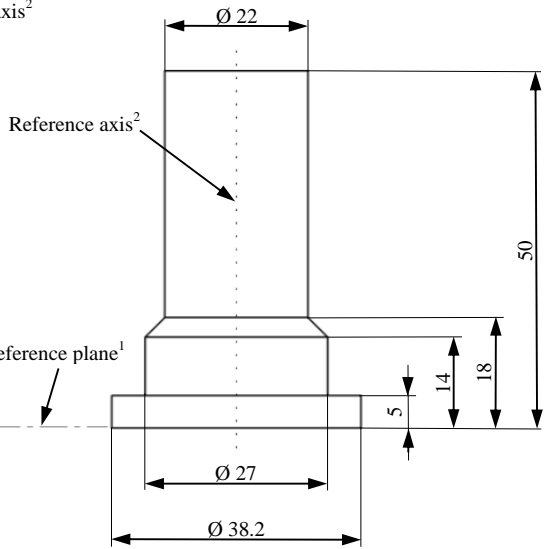


Figure 2
Maximum lamp outlines⁴

”

Sheet H19/2, table, amend to read:

“ ...

Dimensions in mm	Filament lamps of normal production	Standard filament lamps
	12 V	12 V
e	28.5 + 0.35 / - 0.15	28.5 + 0.20 / - 0.0
p	28.95	28.95
α	max. 45°	max. 45°
Cap PU43t-3 in accordance with IEC Publication 60061 (sheet 7004-171+2)		

Electrical and photometric characteristics					
Rated values	Volts	12 ⁶		12 ⁶	
	Watts	60	55	60	55
Test values voltage	Volts	13.2	13.2	13.2	13.2
Objective values	Watts	72 max	68 max.	72 max.	68 max.
	Luminous flux	1,750 ± 10%	1,200 ± 10%		
Reference luminous flux at approximately			13.2 V	1,750	1,200

”

Sheet H19/5, insert a new footnote 13:

“ ...

¹³ **Internal shield, not intended for producing the cut-off-line.”**

Sheet H20/3, table, amend to read:

“

...	
	
...	
Objective values		Watts	75 max.	75 max.
		Luminous flux	1,250 ± 10 %	
Reference luminous flux at approximately			12 V	900
			13.2 V	1,250
...

”

Sheet H21W/2, insert a page break after paragraph 3.2. and start sheet H27W/1 at the next page.

Sheet HS1/2, table, amend to read:

“

Dimensions in mm		Filament light sources of normal production				Standard filament light source	
		6 V		12 V		12 V	
e		28.5 + 0.45 / -0.25				28.5 + 0.20 / -0.00	
p		28.95				28.95	
α		max. 40°				max. 40°	
Cap PX43t in accordance with IEC Publication 60061 (sheet 7004-34-2)							
Electrical and photometric characteristics							
Rated values	Volts	6 ^{6/}		12 ^{6/}		12 ^{6/}	
	Watts	35	35	35	35	35	35

Dimensions in mm		Filament light sources of normal production				Standard filament light source	
		6 V		12 V		12 V	
Test voltage	Volts	6.3		13.2		13.2	
Objective values	Watts	35	35	35	35	35	35
	± %	5				5	
	Luminous flux	700	440	825	525		
	± %	15					
Measuring flux ^{7/} lm		-		-	450 525		
Reference luminous flux at approximately					12 V	700	450
					13.2 V	825	525

”

Sheet P21/5W/1, insert a page break after the table and start sheet P21/5W/1 at the next page.

Sheet S1/S2/1, the introductory text above the figures, amend to read:

“The drawings are intended only to illustrate the essential dimensions (in mm) of the filament light source.

Filament lamps for motorcycles”

Sheet WY21W/1, table, amend to read:

“ ...

Dimensions in mm	Filament light sources of normal production			Standard filament light source
	Min.	Nom.	Max.	
e		29.0 ^{2/ 3/}		29.0 ± 0.3
f			7.5	7.5 + 0 / -2
Lateral deviation ^{1/}			^{2/ 3/}	0.5 max.
...

”

Annex 3,

Sheet L1/2, table 1, amend to read:

“

Dimensions		Production LED light sources	Standard LED light sources
a	mm	6.0 max.	
b	mm	c + 10.0 min. 38.0 max.	
c	mm	18.60	
d	mm	28.0 max.	
e	mm	3.00 ± 0.30	3.00 ± 0.10
h ⁸	mm	4.88	
k ⁹	mm	7 min.	
m ⁹	mm	4.5 max.	
Cap PGJ18.5d-29 in accordance with IEC Publication 60061 (sheet 7004-185-42) ¹⁰			
Electrical and photometric characteristics ⁵			
Rated Values	Voltage (in Volts)	12	

	Power (in Watts)		4.0			
Test voltage	Volts (DC)		13.2	13.5	13.2	13.5
Objective values ⁶	Power (in Watts) at test voltage 13.2V DC at 13.5V DC		6.0 max 6.0 max			
	Luminous Flux (in lumen) at test voltage		350 ± 20%	355 ± 20%	350 ± 10%⁷	355 ± 10%
	Luminous Flux (in lumen) at 13.2V DC at 13.5V DC		350 ± 20% 355 ± 20%		350 ± 10%⁷ 355 ± 10%	
	Luminous Flux (in lumen) at 9V DC		70 min.			
Characteristics of the light-emitting area						
Contrast			200 min.		200 min. 400 max.	
Size of light emitting area in relation to size of nominal emitter box ³			75% min.		75% min.	
Uniformity R _{0.1} – surface ratio with luminance exceeding 10% of average luminance			75% min.		85% min.	
Uniformity R _{0.7} – surface ratio with luminance exceeding 70% of average luminance			55% min.		65% min.	
Specific thermal test conditions						
Maximum test temperature			65 °C		65 °C	

”

Sheet L1/4, the introductory text above Figure 4, amend to read:

“... ”

The following test is intended to determine the normalized luminous intensity distribution of the light source in an arbitrary plane containing the reference axis. The intersection of the reference axis and the upper edge of the box is used as the coordinate system origin.

The light source is mounted on a flat plate with the corresponding mounting lug features. The plate is mounted to the goniometer table by a bracket, so that the reference axis of the light **source lines up with one of the rotating axis of the goniometer. The corresponding measurement set-up set-up** is described in Figure 4.

Luminous intensity data is recorded ~~for the major function~~ with a standard photogoniometer. The measurement distance should be chosen appropriately, to make sure that the detector is located in the far field of the light distribution.

The measurements shall be performed in C-planes C₀, C₉₀, C₁₈₀ and C₂₇₀, which contain the reference axis of the light source. The test points for each plane for multiple polar angles γ are specified in Table 3.

After measurement the data shall be normalized to 1000 lm according to paragraph ~~3.1.4~~ **2.4.4.** using the luminous flux of the individual light source under test. The data shall comply with the tolerance band as defined in Table 3.

The drawings are intended only to illustrate the essential set-up for measurement of the LED light source....”

Sheet L1/5, the text above table 3, amend to read:

“ The light pattern as described in Table 4-3 shall be substantially uniform, i.e. in between two adjacent grid points the relative luminous intensity requirement is calculated by linear interpolation using the two adjacent grid points. In case of doubt this may be checked in addition to verification of the grid points given in ~~Table 4-3.~~”

Sheet L1/5, table 3, title, amend to read:

“Test point values of normalized intensities of normal production and standard ~~lamps~~ **light sources**, respectively”

Sheet LR1/2, table, amend to read:

“ ...

Dimensions in mm		Tolerance			
		LED light sources of normal production		Standard LED light source	
e ^{3/ 7/}	24.0	0.2		0.1	
Cap PGJ21t-1 in accordance with IEC Publication 60061 (sheet 7004-165-1)					
Electrical and photometric characteristics ^{5/}					
Rated values		Minor function	Major function	Minor function	Major function
	Volts	12		12	
Test voltage	Volts (DC)	13.5		13.5	
Objective Values ^{6/}	Watts (at test voltage 13.5 V DC)	0.75 max.	3.5 max. 1.4 min.	0.75 max.	3.5 max. 1.4 min.
	Luminous flux (in lm at test voltage 13.5 V DC)			3.5 ± 10%	47 ± 10%
	Luminous flux (in lm at 10-16 V DC)	3.5 ± 20%	47 ± 20%		

”

Sheet LR1/4, penultimate paragraph, amend to read:

~~“The measured luminous intensity values, normalised to the measured luminous flux of the individual LED light source under test, shall be converted to normalised luminous intensity values of a 1000 lm LED light source. After measurement the data shall be normalized to 1,000 lm according to paragraph 2.4.4. using the luminous flux of the individual light source under test. The data shall comply with the tolerance band as defined in Table 3.~~

...”

Sheet LW2/1, table, amend to read:

“ ...

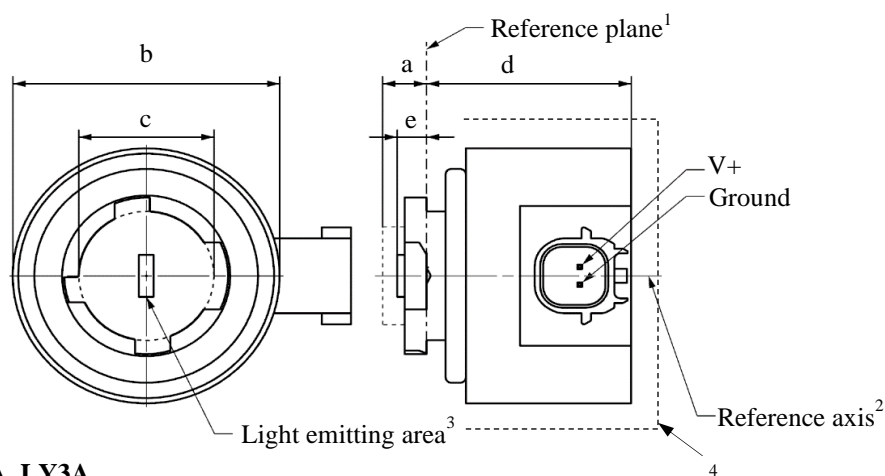
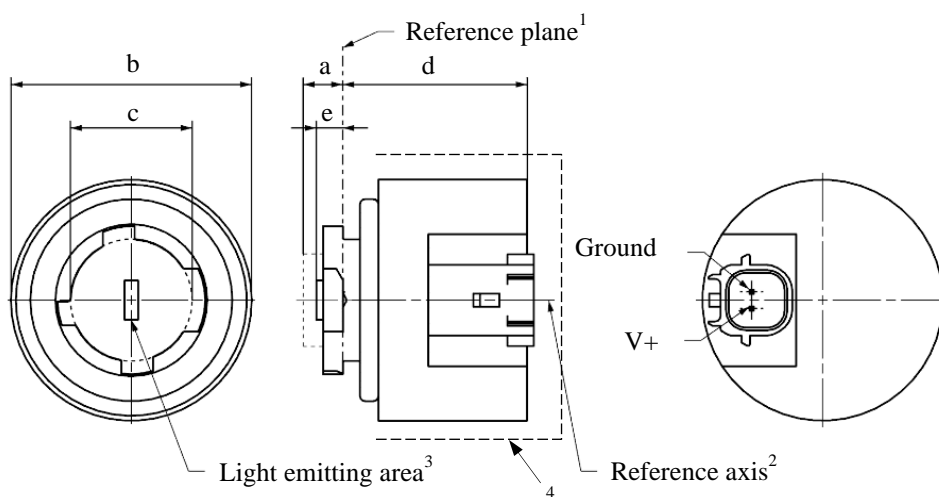
Dimensions in mm		Tolerances			
		LED light sources of normal production		Standard LED light sources	
e ^{8/}	26.4	0.2		0.1	
Cap PGJY50 in accordance with IEC Publication 60061 (sheet 7004-182-1)					
Electrical and photometric characteristics ^{5/}					
Rated values		Minor function	Major function	Minor function	Major function
	Volts	12		12	

Test voltage	Volts (DC)	13.5		13.5	
Objective Values ^{6/ 7/}	Watts (at test voltage 13.5 V DC)	1 max.	12 max. 4 min.	1 max.	12 max. 4 min.
	Luminous flux (in lm at test voltage 13.5 V DC)			50 ± 10%	725 ± 10%
	Luminous flux (in lm at 10-16 V DC)	50 ± 15%	725 ± 15%		
Corresponding base temperature T _b in °C		30 ± 2	55 ± 2	30 ± 0.5	55 ± 0.5

”

Sheet Lx3/1, figure 1, amend to read:

“

**LR3A, LW3A, LY3A****LR3B, LW3B, LY3B**

”

Sheet Lx3/2, table 1 and footnote 4, amend to read:

“

Dimensions			Production LED light sources		Standard LED light sources	
a		mm	6.0 max.			
b		mm	c + 10.0 min. 38.0 max.			
c		mm	18.5 ± 0.1			
d		mm	28.0 max.			
e ^{13/}		mm	3.0 ± 0.30		3.0 ± 0.15	
h		mm	5.5 ± 0.0/ - 0.1			
Cap	LR3A, LR3B	PGJ18.5d-1	in accordance with IEC Publication 60061 (sheet 7004-185-42)			
	LW3A, LW3B	PGJ18.5d-24				
	LY3A, LY3B	PGJ18.5d-15				
Electrical and photometric characteristics						
Rated values	Volts		12			
		LR3A, LR3B	3			
	Watts	LW3A, LW3B LY3A, LY3B	4			
Test voltage	Volts (DC)		13.5			
Objective Values ⁸	Watts	LR3A, LR3B	3.5 max.			
	(at test voltage 13.5 V DC)	LW3A, LW3B	5 max.			
		LY3A, LY3B				
	Luminous flux (in lm at test voltage 13.5 V DC)	⁵ LR3A, LR3B	80 ± 20% ⁹		80 ± 10% ¹⁰	
		⁶ LW3A, LW3B	250 ± 20%		250 ± 10% ¹¹	
		^{7, 12} LY3A, LY3B	150 ± 20% ⁹		150 ± 10% ¹⁰	
	Luminous flux (in lm at 9 V DC)	⁵ LR3A, LR3B	19 min			
		⁶ LW3A, LW3B	50 min.			
^{7, 12} LY3A, LY3B		30 min				

1/ ...

2/ ...

3/ ...

4/ A minimum free air space of 5 mm around the light source shall be respected for convection-; **the connector interface can be neglected.**

5/ ...

6/ ...

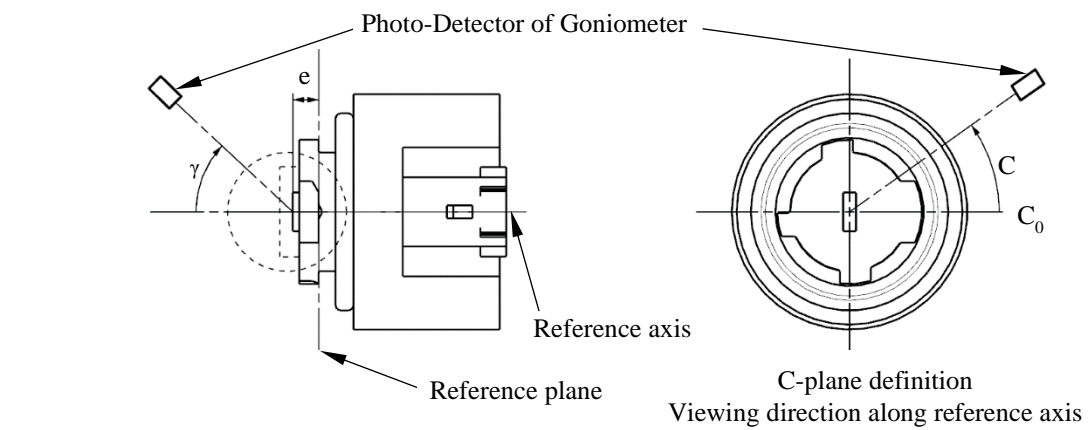
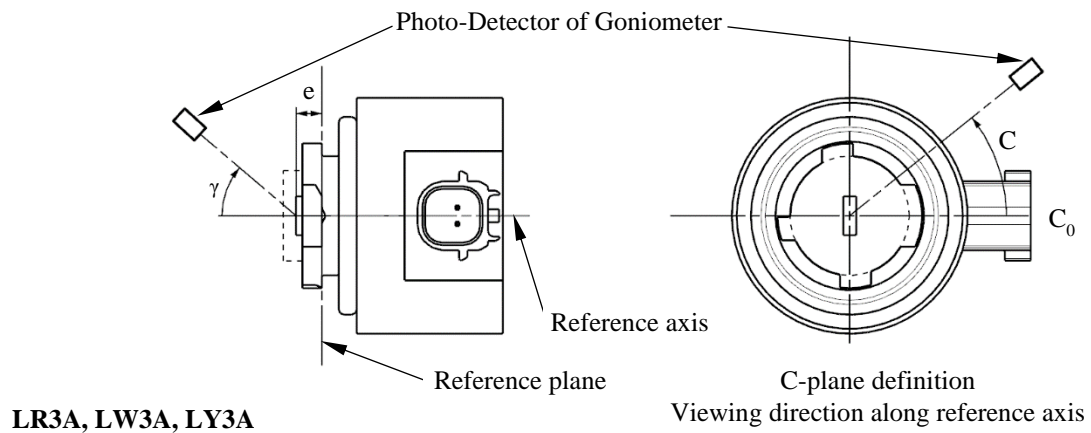
...”

Sheet Lx3/5, fifth indent, amend to read:

“ ~~The measured luminous intensity values, normalised to the measured luminous flux of the individual light source under test, shall be converted to normalised luminous intensity values of a 1,000 lm light source.~~ **After measurement the data shall be normalized to 1,000 lm according to paragraph 2.4.4. using the luminous flux of the individual light source under test.** The data shall comply with the tolerance band as defined in Tables 4a and 4b...”

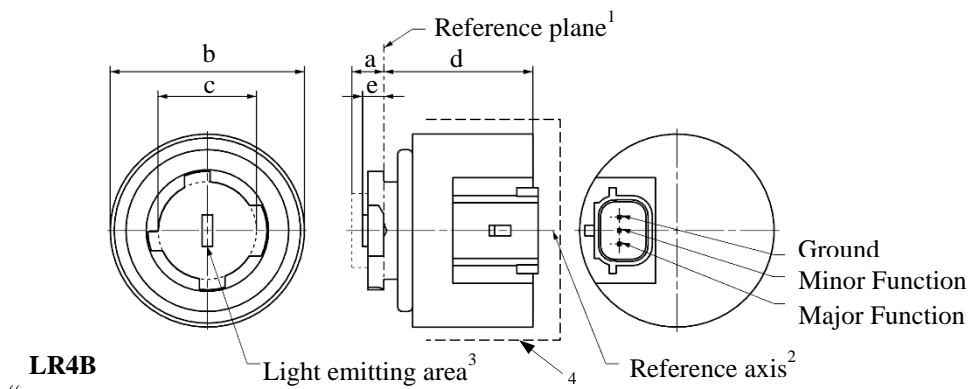
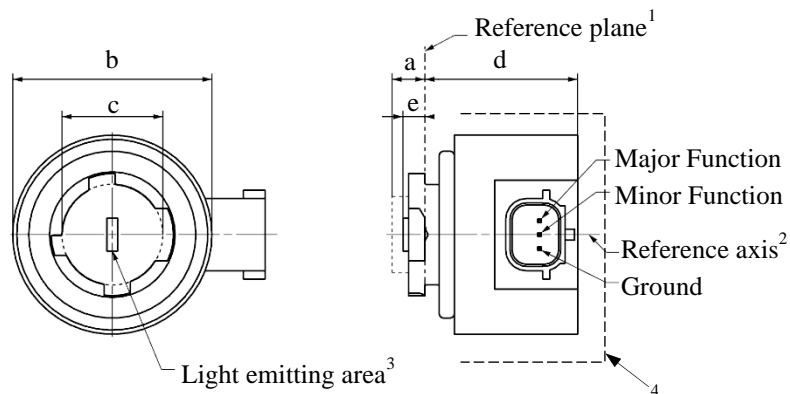
Sheet Lx3/5, figure 3, amend to read:

“



”

Sheet LR4/1, figure 1, amend to read:



Sheet LR4/2, table 1 and footnotes 4 and 9, amend to read:

“...

Dimensions		Production LED light sources	Standard LED light sources		
a	mm	6.0 max.			
b	mm	c + 10.0 min. 38.0 max.			
c	mm	18.5 ± 0.1			
d	mm	28.0 max.			
e ^{9/}	mm	3.0 ± 0.30	3.0 ± 0.15		
h	mm	5.5 ± 0.0/— 0.1			
Cap PGJ18.5t-5 in accordance with IEC Publication 60061 (sheet 7004-185-42)					
Electrical and photometric characteristics ⁵					
Rated values		Minor function	Major function	Minor function	Major function
	Volts	12		12	
	Watts	0.75	3	0.75	3
Test voltage	Volts (DC)	13.5		13.5	
Objective Values ⁶	Watts (at test voltage 13.5 V DC)	1.0 max.	3.5 max.	1.0 max.	3.5 max.
	Luminous flux (in lm at test voltage 13.5 V DC)	6 ± 20%	80 ± 20% ⁷	6 ± 10%	80 ± 10% ⁸
	Luminous flux (in lm at 9 V DC)	1.5 min.	19 min.		

^{1/} The reference plane is the plane defined by the contact points of the cap-holder fit.

^{2/} The reference axis is perpendicular to the reference plane and passing through the centre of the Bayonet core.

^{3/} Light emitting area: to be checked by means of the box system in Figure 2

^{4/} A minimum free air space of 5 mm around the LED light source shall be respected for convection; **the connector interface can be neglected.**

^{5/} The emitted light shall be red.

^{6/} After continuous operation for 30 minutes at 23 ± 2.5° C.

^{7/} The measured value shall be in between 100 per cent and 70 per cent of the value measured after 1 minute.

^{8/} The measured value shall be in between 85 per cent and 75 per cent of the value measured after 1 minute.

^{9/} Light centre length, **both functions are operated at the same time during the measurement; for the method of measurement, see Annex K of IEC Publication 60809, Edition 3.3.**

^{10/} The measured value shall be in between 100 per cent and 80 per cent of the value measured after 1 minute

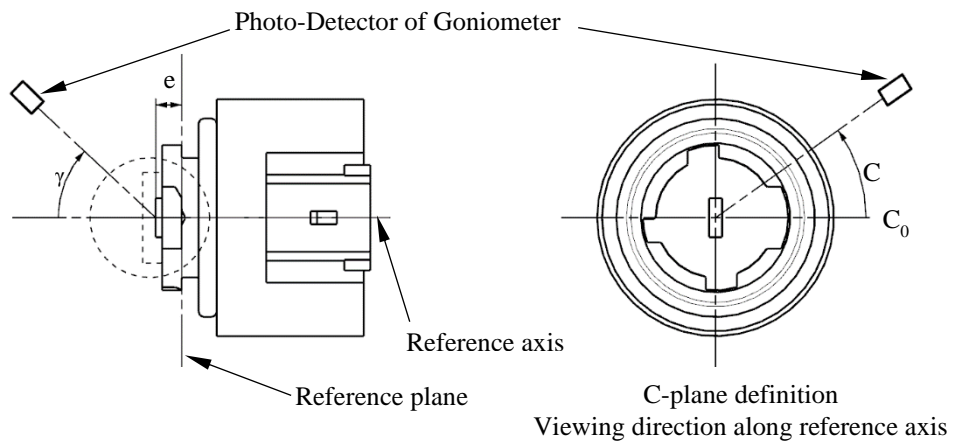
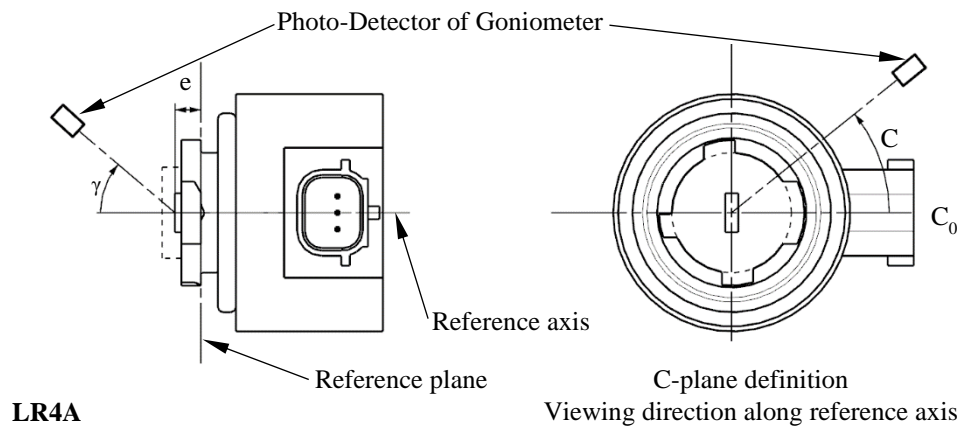
”

Sheet LR4/4, fifth indent, amend to read:

“ After measurement the data shall be normalized to 1,000 lm according to paragraph 3.1.4 ~~2.4.4.~~ using the luminous flux of the individual light source under test. The data shall comply with the tolerance band as defined in Table 4.”

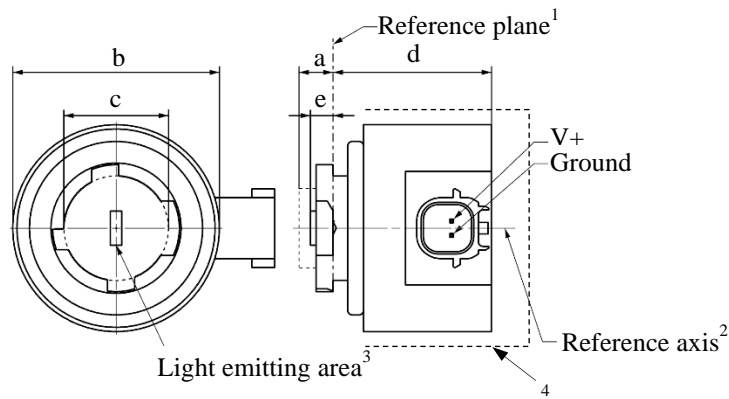
Sheet LR4/4, figure 3, amend to read:

“

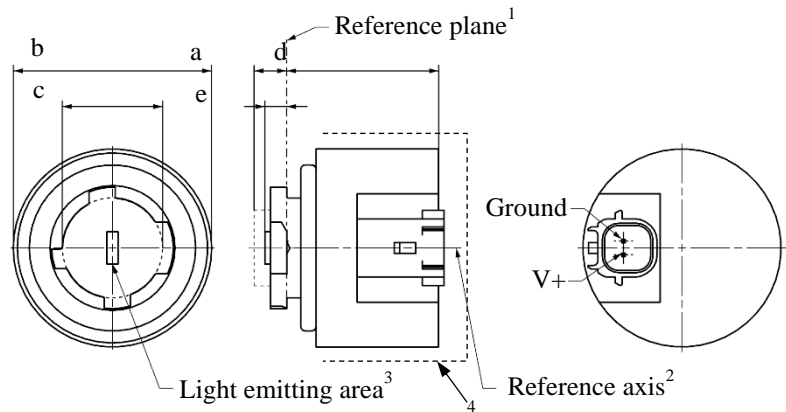


”

Sheet Lx5/1, figure 1, amend to read:



LR5A, LW5A, LY5A



LR5B, LW5B, LY5B

”

Sheet Lx5/2, table 1 and footnote 4, amend to read:

“ ...

Dimensions			Production LED light sources		Standard LED light sources	
a		mm	6.0 max.			
b		mm	c + 10.0 min. 38.0 max.			
c		mm	18.5 ± 0.1			
d		mm	28.0 max.			
e ^{11/}		mm	3.0 ± 0.30		3.0 ± 0.15	
h		mm	5.5 ± 0.0/- 0.1			
Cap	LR5A, LR5B	PGJ18.5d-10	in accordance with IEC Publication 60061 (sheet 7004-185-42)			
	LW5A, LW5B	PGJ18.5d-28				
	LY5A, LY5B	PGJ18.5d-19				
Electrical and photometric characteristics						
Rated values	Volts		12			
	Watts	LR5A, LR5B	3			
		LW5A, LW5B	6			
		LY5A, LY5B				
Test voltage	Volts (DC)		13.5			

Objective Values ⁸	Watts (at test voltage 13.5 V DC)		LR5A, LR5B	3.5 max.	
			LW5A, LW5B	8 max.	
		10	LY5A, LY5B		
	Luminous flux (in lm at test voltage 13.5 V DC)	5	LR5A, LR5B	120 ± 15%	120 ± 5% ⁹
		6	LW5A, LW5B	350 ± 20%	350 ± 10% ⁹
		7, 10	LY5A, LY5B	280 ± 20%	280 ± 10% ⁹
	Luminous flux (in lm at 9 V DC)	5	LR5A, LR5B	28 min.	
		6	LW5A, LW5B	65 min.	
		7, 10	LY5A, LY5B	55 min.	

1/ ...

2/ ...

3/ ...

4/ A minimum free air space of 5 mm around the light source shall be respected for convection-; **the connector interface can be neglected.**

5/ ...

6/ ...

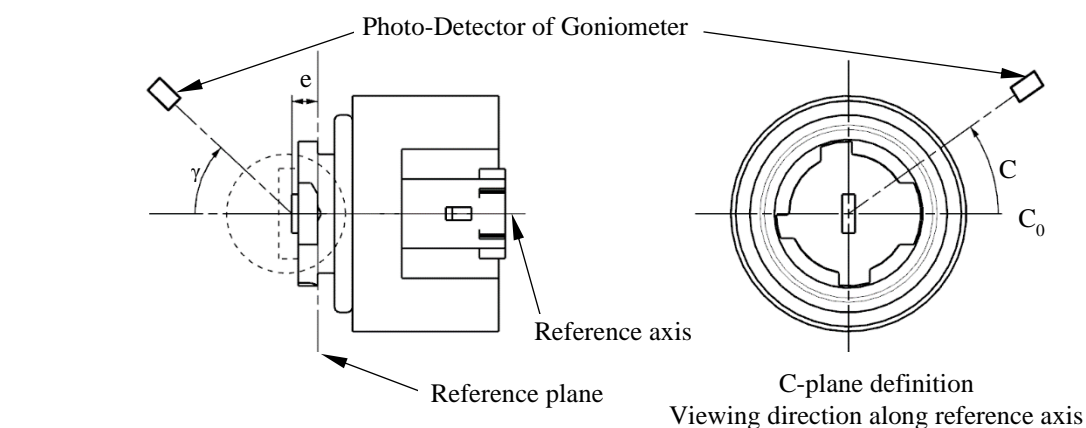
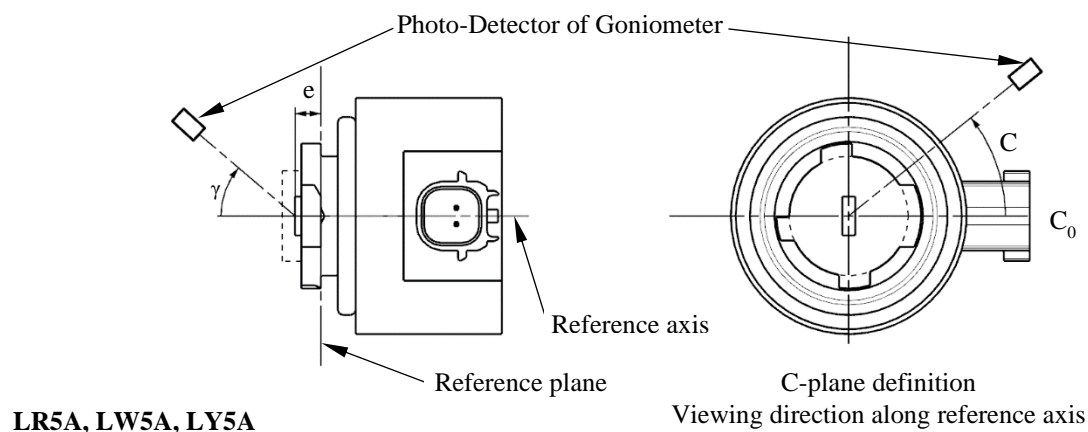
...”

Sheet Lx5/5, fifth indent, amend to read:

“ ~~The measured luminous intensity values, normalised to the measured luminous flux of the individual light source under test, shall be converted to normalised luminous intensity values of a 1,000 lm light source. After measurement the data shall be normalized to 1,000 lm according to paragraph 2.4.4. using the luminous flux of the individual light source under test.~~ The data shall comply with the tolerance band as defined in Table 4...”

Sheet Lx5/5, figure 3, amend to read:

“



”

II. Justification

1. This document is a consolidation of proposed amendments by experts in GTB to the Consolidated Resolution on the common specification of light source categories (R.E.5) (ECE/TRANS/WP.29/1127). The amendments cover a number of topics and for clarity the justification for the document is structured to provide the justifications by topic under their respective topic headers.

A. Amendment of the measuring luminous flux and references to the internal shield for applicable filament light source categories

2. With the introduction of R.E.5 there has been a change in the text of paragraph 3.9. in UN Regulation No. 37, “Check of the optical quality”. Up to supplement 44 of UN Regulation No. 37, the regulatory text explicitly mentions the three filament light sources (R2, H4, HS1) for which this test is required. With the introduction of R.E.5 the list of the three light sources was replaced in UN Regulation No. 37, supplement 45 by the remark “(Applies only to filament light sources with an internal shield to produce the cut-off)”. At the moment the data sheets of light sources with an internal shield do not contain information for which light sources the inner shield is intended to produce the cut-off. With the creation of R.E.5, the three filament light sources, R2, H4, HS1, for which the optical quality test is necessary can only be identified because of the presence of an extra row in the table in the data sheet with the parameter “measuring luminous flux”, a value that is required to be set for the measurements involved with the optical quality check. The extra row in the table of the data sheet with the parameter “measuring luminous flux” is not present for the other category data sheets of light sources with an internal shield.

3. Footnote * of paragraph 3.1. includes the case where more than one value of the reference luminous flux is specified for a category of filament light source. According to the footnote, the value of reference luminous flux at approximately 12 V is used for a lighting device, and the value at approximately 13.5 V is used for a light-signalling device. However, the reference luminous flux at approximately 13.2 V is not listed in the footnote. While the 13.2 V value is absent from the footnote, some sheets of filament light sources list values of the reference luminous flux at approximately 13.2 V.

4. According to UN Regulation No. 37, checking of optical quality shall be carried out for filament light sources with an internal shield to produce the cut-off. When checking on optical quality, a value of the measuring luminous flux is needed. For 12 V types of light source categories H4 and HS1, the current value of the measuring luminous flux is the same as the value of reference luminous flux at approximately 12 V. However, the reference luminous flux used for measuring the light distribution of passing beam of headlamps had been changed from the value at 12 V to the value at 13.2 V in UN Regulation No. 112. Then, when checking on optical quality of a 12 V type of H4 or HS1 with the current value of measuring luminous flux, the measured value of luminous intensity shall be multiplied by a correction factor in order to verify the compliance with the photometric requirements. For the 24 V type of H4, the current value of measuring luminous flux is the luminous flux value at approximately 24 V. When checking on optical quality of the 24 V type of H4 with the current value of measuring luminous flux, the measured value of luminous intensity shall be corrected relative to the objective luminous flux at 28.0 V.

5. In this document GTB proposes to introduce a note in the light source data sheets of light sources with an internal shield to specify whether the internal shield is not intended for producing the cut-off. Through the inclusion of such a note all necessary information about the necessity to do the optical check can be obtained from the relevant data sheet. The addition of this note eliminates confusion, because in combination with the parameter “measuring luminous flux” it will be unambiguous for which of the filament light sources with an internal shield the optical quality test is required.

6. GTB further proposes to amend footnote * of paragraph 3.1., to include the reference luminous flux at approximately 13.2 V.

7. This document also includes proposed amendments of the category sheets of H4 and

HS1, to update the values of the measuring luminous flux to the respective values of the objective luminous flux at 13.2 V, in order to meet the current practice for passing beam headlamps in UN Regulation No. 149. This will eliminate the need for a correction of the measured values of luminous intensity when doing the check for the optical quality.

B. Amendment of the specifications for H7, H8/H8B, H11/H11B, H16/H16B and H18 light source categories with respect to the “g” parameter

8. The value of the “g” parameter of standard bulbs for categories H7, H8/H8B, H11/H11B, H16/H16B and H18 has been listed as “u.c.” (“under consideration”) pending experience in determining “g” for these light sources by light source manufacturers.

9. Experts from light source manufacturers have now confirmed that, based on experience and in-house practice, it is supported to adopt the ($g = 0.5$ min.) value specified for light sources of normal production of these categories also for the standard light source of these categories.

10. This proposal introduces the value for dimension g ($g = 0.5$ min.) for the standard light source of categories H7, H8/H8B, H11/H11B, H16/16B and H18, in the respective tables of sheets H7/3, H8/3, H11/3, H16/3, and H18/3.

C. Amendment of the definition for light centre and associated amendment to the specification of the LR4 light source category

11. Since the adoption of the LED light sources experience has been gained with the measurement of such light sources. As a result of this the need was identified to improve the definition for the light centre in the Consolidated Resolution on the common specification of light source categories (R.E.5). Furthermore, a clarification of the light centre length (LCL) requirement for the dual-mode category LR4 was needed, as it was not specified to which function (minor, major, or both) this requirement applies.

12. Experts from GTB determined that for LED light sources the LCL refers to the apparent (virtual) origin instead of the physical origin. It was further clarified that for the LR4 light source category both minor and major functions are operated at the same time during the measurement of the light centre length.

13. In this document GTB proposes to improve the definition of light centre (paragraph 2.2.3.) in the Consolidated Resolution on the common specification of light source categories (R.E.5).

14. GTB further proposes to amend footnote 9 of category LR4 to provide the clarification that both minor and major functions are operated at the same time during the measurement of the light centre length. A normative reference to the method of measurement in Annex K of IEC Publication 60809, Edition 3.3 is added.

D. Amendment with the aim to clarify the use restriction for light emitting diode (LED) light source categories LW2, LW3, and LW5.

15. This is a proposal for the insertion of a use restriction for the white LED light source categories LW2, LW3, and LW5 in R.E.5. The need to add this use restriction was identified following the introduction of footnote 2 for the substitute light source categories C5W/LEDK and W5W/LEDK. In this proposal the same footnote 2 is added to categories LW2, LW3, and LW5 to indicate that there is no correlated color temperature restriction on the white light for these categories.

E. Amendment of the specifications for Lx3, LR4 and Lx5 light source categories with respect to the cap/holder interface.

16. Since the adoption of the LR3 category sheet some fundamental changes in the concept have been implemented. One of the changes is the requirement of a seal function on the cap/holder interface. Therefore, the figures in the category sheets established for (and derived from) the LR3 are no longer representing the products with respect to the details for the cap holder interface as in detail defined in the IEC standard IEC 60061 Sheets 7004-185 and 7005-185.

17. With respect to the dimension “h” in the related category sheets there is no longer a need to restrict the dimension in its maximum. Motivation: the function to hold the light source in its axial position on the reference plane is granted by the combination of:

- The limits in the holder (sheet 7005-185, dimension E, E1 and B1) and,
- The requirements of the sealing-feature of the cap (sheet 7004-185, dimension E and note 6).

18. Since the introduction of the L1/6 category sheet a more realistic image is used, in combination with the removal of the dimension “h” (as considered an over-constrained requirement), and an amendment for the IEC Cap sheet is prepared to add the related requirement for the maximum material on the related section.

19. Current figures in category sheet Lx3/1, Lx3/4, LR4/1, LR4/5, Lx5/1, and Lx5/4 in combination with the limitation of the maximum value for dimension h give rise to unnecessary discussion and confusion with respect to the dimensions mentioned on the related IEC cap sheet. A parallel process is started to embed the minimum value related to the section defined by current dimension h from the category sheet to complete the cap definition as this dimension shall be mentioned on the cap sheet to match the related holder definition.

20. It is proposed to amend the following categories (sheet no.):

- LR3A, LR3B, LW3A, LW3B, LY3A and LY3B (Sheet Lx3/1, Lx3/2 and Lx3/5);
- LR4A and LR4B (Sheet LR4/1, LR4/2 and LR4/4);
- LR5A, LR5B, LW5A, LW5B, LY5A, LY5B (Sheet Lx5/1, Lx5/2 and Lx5/5).

For each of the listed sheets, the amendments include:

- (i) Replacement of Figure 1 with figures similar to the figures used for category L1/6;
- (ii) Deletion of the row with the dimension h from in Table 1;
- (iii) Alignment of the Figure 3 “Set-up to measure the luminous intensity distribution” with the Figure 1 to avoid confusion.

F. Amendment of the specifications for specifications for LR1, LW2, L3, LR4, L5, and L1/6 light source categories with respect to test voltage

21. Unlike category sheets for filament light sources and gas-discharge light sources, the category sheets for LED light sources do not explicitly name the term “test voltage” (defined under 2.3.1. in R.E.5). This could lead to misinterpretations especially in combination with the 9V-requirement (introduced for the sheets L3, LR4 and L5) and the definition of “objective values” (under 2.1.4. in R.E.5).

22. Experts from GTB evaluated this situation and concluded that the term “test voltage” needed to be introduced for all existing LED category sheets to avoid misinterpretations.

23. In this document GTB proposes to introduce the “test voltage” for categories LR1, LW2, L3, LR4, L5, and L1/6 in the respective tables of sheets LR1/2, LW2/1, L3/2, LR4/2, L5/2, and L1/2. As there is more than one test voltage for the categories L1/6, it is proposed

to adjust the format of the table in conjunction with the introduction of the test voltage, for clarity.

G. Amendments to correct some details of light source category specifications in the Consolidated Resolution on the common specification of light source categories

24. With the publication of Revision 8 of UN Regulation No. 37 and the subsequent adoption of R.E.5 (ECE/TRANS/WP.29/1127) and its subsequent amendment (ECE/TRANS/WP.29/2018/33/Rev.1), light source experts and users of light source Regulations have made the correct linkages between the Resolution and third party documents. As links are established, the content of R.E.5 is continuously reviewed.

25. This proposal is to correct a number of minor editorial errors in category sheets of filament and LED light sources that were uncovered while making such linkages and which have not been detected before. Some of the errors were already present at introduction of the respective light source category; others appeared after revisions of the regulation documents. Some of the corrections are intended to avoid misinterpretation but do not change the substance. All corrections speak for themselves.

26. The corrections include minor editorial errors in category sheets of filament light source categories H14, H19, H20, H27W/1, P21/5W, S1/S2 and WY21W, and LED light source categories L1 and LR4.

27. The amendment to sheet S1/S2/1 is a consequence of the light source simplification process. Before simplification of UN Regulations Nos. 37, 99 and 128 there were use restrictions on light sources in the grouping and in the category sheets, e.g. in S3-sheet it was said “filament lamp for moped” and in HS5-sheet, S1/S2-sheet it was said “filament lamp for motorcycles”. At the time of the creation of R.E.5 all use restrictions have been moved to the table, in the form of footnotes. These use restrictions now concern lamps, rather than vehicles, as it is not known where a lamp will be applied. So, the restriction for S1 and S2 concerning motorcycles was changed into a restriction that referred to a lamp since a vehicle restriction could no longer be enforced. In the context of this the former text “filament lamp for motorcycles” in sheet S1/S2/1 is now covered by footnote 5 in paragraph 3.1. of R.E.5.

28. Furthermore, proposed amendments to make the description of normalized luminous intensity in category sheets LR1/4, Lx3/5 and Lx5/5 consistent with category sheets L1/4 and LR4/4 are presented.

29. While some of the errors were already present at the introduction of the respective light source category and could be considered to be corrigenda, all corrections are presented as an amendment because corrections to older revisions of UN Regulation No. 37 would create an enormous administrative issue while these errors were not essential for approval. For this reason, the corrections are presented as amendments to the Consolidated Resolution.

H. Amendments to make the administrative updates of IEC cap sheet references in light source category specifications

30. This proposal includes a customary administrative update of an IEC cap sheet number in the IEC cap sheet reference (sheet 7004-171-2) for light source category H19.

31. This proposal also includes an administrative update of an IEC cap sheet number in the IEC cap sheet reference (sheet 7004-185-2) for light source categories Lx3, LR4, and Lx5.

32. This proposal further includes an administrative update of an IEC cap sheet number in the IEC cap sheet reference for the categories L1/6. The square brackets around the cap sheet version number were removed (sheet 7004-185-2).