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Working Party on Lighting and Light-Signalling (GRE)
(Forty-ninth session, 30 September - 4 October 2002,
agenda item 7.8.)

PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 37

(Filament lamps)

Transmitted by the Expert from the Working Party "Brussels 1952" (GTB)

Note: The text reproduced below was prepared by the expert from GTB in order to introduce in the Regulation filament lamps emitting red light of the categories: PR21W, PR21/4W, PR21/5W, RR5W, RR10W, WR5W, PR27/7W, PR19W, PSR19W, PR24W, PSR24W.

Draft proposal is based upon:

- the text of revision 3
 - including (draft) Supplements 21 and 22;
- moreover:
- boundaries for red colour tolerance area are as specified in TRANS/WP.29/GRE/2002/17 (collective amendment to Regulations Nos. 3, 7, 38, 50, 77, 91);
 - errata as proposed in TRANS/WP.29/GRE/2002/23.

Note: This document is distributed to the Experts on Lighting and Light-Signalling only.

A. PROPOSAL

List of contents, annexes,

Annex 1, amend the list to read:

" ...
Sheet R5W, RR5W (only for signalling lamps)
Sheet R10W, RY10W, RR10W (only for signalling lamps)
...
sheet W5W, WY5W, WR5W (only for signalling lamps)
...
Sheet P27/7W (only for signalling lamps)
Sheets H21W (only for signalling lamps)
...
Sheets P19W, PY19W, PR19W
PS19W, PSY19W, PSR19W (only for signalling lamps)
Sheets P24W, PY24W, PR24W
PS24W, PSY24W, PSR24W (only for signalling lamps)"

Annex 1, add at the end of the list new sheets, to read:

" ...
Sheet PR21W (only for signalling lamps)
Sheet PR21/4W (only for signalling lamps)
Sheet PR21/5W (only for signalling lamps)
Sheet PR27/7W (only for signalling lamps)"

Text of the Regulation,

Paragraph 3.1.5., amend to read:

"3.1.5. Standard (étalon) filament lamp: a filament lamp emitting white or amber or red light with reduced dimensional tolerances, used for ..."

Paragraph 3.6.2., add at the end of the paragraph to read:

" ...
finished filament lamps emitting red light:

limit towards yellow: $y \leq 0.335$
limit towards purple: $y \leq 0.980 - x$ "

Paragraph 3.6.3., footnote 5/, amend to read:

"5/ For Conformity of Production purposes and for amber and red colour only, ... "

Paragraph 3.10., amend to read:

" ...
For standard (étalon) filament lamps emitting amber or red light, changes of the bulb temperature shall not affect the luminous flux which might impair photometric measurements of signalling devices. Moreover, for amber standard (étalon) filament lamps the colour shall be in the lower part of the tolerance area."

Annex 1, Sheet PY21W/1,

replace in the table "Clear bulb" by "White";
replace in the table "Amber bulb" by "Amber";

amend footnote 4/, to read:

"4/ The light emitted from standard filament lamps shall be amber or white."

Annex 1, Sheet WY21W/1,

replace in the table "Clear bulb" by "White";
replace in the table "Amber bulb" by "Amber";

amend footnote 4/ to read:

"4/ The light emitted from standard filament lamps shall be amber or white."

Annex 1, Sheet WY2.3W/1,

replace in the table "Clear bulb" by "White";
replace in the table "Amber bulb" by "Amber";

amend footnote 3/ to read:

"3/ The light emitted from standard filament lamps shall be amber or white."

Annex 1, Sheet WP21W/1,

replace in the table "Clear bulb" by "White";
replace in the table "Amber bulb" by "Amber";

amend footnote 4/ to read:

"4/ The light emitted from filament lamps of normal production shall be amber. (See also note 5/)";

add new footnote 5/ to read:

"5/ The light emitted from standard filament lamps shall be amber or white."

Annex 1,

Sheet P21W/2,

replace by new sheet P21W/2

Sheet R5W,

replace by the new sheet R5W and RR5W

Sheet R10W and RY10W,

replace by the new sheet R10W, RY10W and RR10W

Sheet W5W and sheet WY5W,

replace by the new sheet W5W, WY5W and WR5W

Sheets PY27/7W,
replace by new sheet PY27/7W

Sheets P19W, PS19W, PY19W and PSY19W,
replace by the new sheets P19W, PY19W, PR19W, PS19W, PSY19W, PSR19W

Sheets P24W, PS24W, PY24W and PSY24W,
replace by the new sheets P24W, PY24W, PR24W, PS24W, PSY24W, PSR24W

Add at the end new data sheets,
PR21W, PR21/4W, PR21/5W, PR27/7W, to read:

(see annexed pages)

Annex 2, item 9, amend to read:

"...
Colour of the light emitted: White/selective-yellow/amber/red 2/ "

* * *

B. JUSTIFICATION

The proposed draft amendments concern the addition of filament lamps emitting red light intended for signalling lamps only. The (harmonised) colour boundaries were specified as in Regulations for signalling lamps.

Proposed datasheets concern red versions of categories of filament lamps that are specified in annex 1 but emitting white and/or amber light.

Although not concerning the technical content, re-arrangement of annex 1 by another amendment might be asked later on to consider as datasheets in annex 1 are more or less listed in historical sequence and added at the end of the annex.

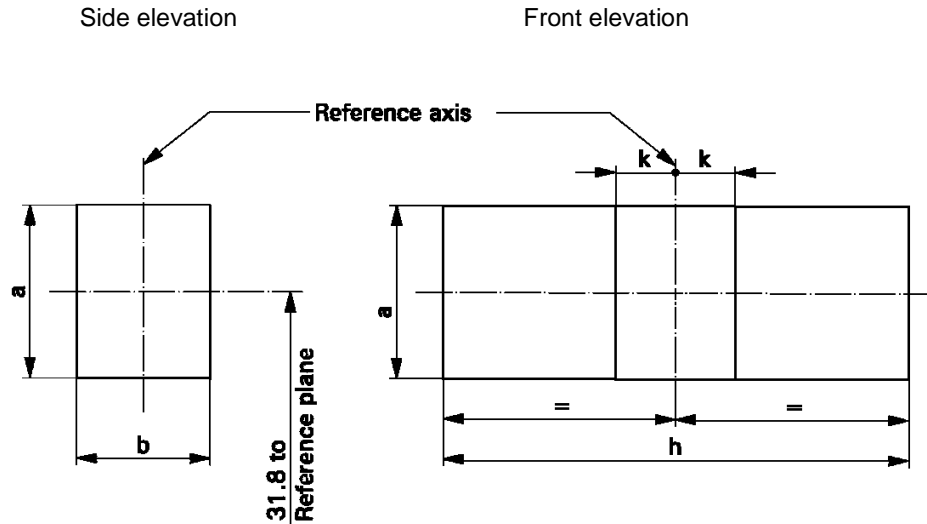
In detail:

- * Sheet P21W/2 was edited to allow references to this sheet from the amber and red versions datasheets.
- * Sheet R5W was extended with data concerning the red version.
- * Sheets R10W and RY10W were put together and extended with data concerning the red version.
- * Sheet W5W and WY5W were put together and extended with data concerning the red version.
- * Sheet PY27/7W/1 was replaced by a new sheet PY27/7W/1 and sheets ../2 and ../3 were removed. The box system P27/7W is the same for PY27/7W. On sheet ../1 a reference to the box system of the white version was made.

- * Sheets P19W, PS19W, PY19W and PSY19W were extended with data concerning the red version.
 - * Sheets P24W, PS24W, PY24W and PSY24W was extended with data concerning the red version.
 - * Sheets PR21W, PR21/4W, PR21/5W, PR27/7W were added; references to the box systems of the white versions were made.
 - * From some footnotes a part from the text was removed as this was covered by the revised paragraph 3.10.
 - * Colour boundaries for red light were introduced.
 - * Text 'clear bulb' was replaced by 'white' light.
-

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and reference plane and has an axis perpendicular, within $\pm 15^\circ$, to the plane through the centre line of the pins (P21W) or of the reference pin (PY21W and PR21W) and the reference axis, whether a filament lamp complies with the requirements.



Reference	a	b	h	k
Dimension	3.5	3.0	9.0	1.0

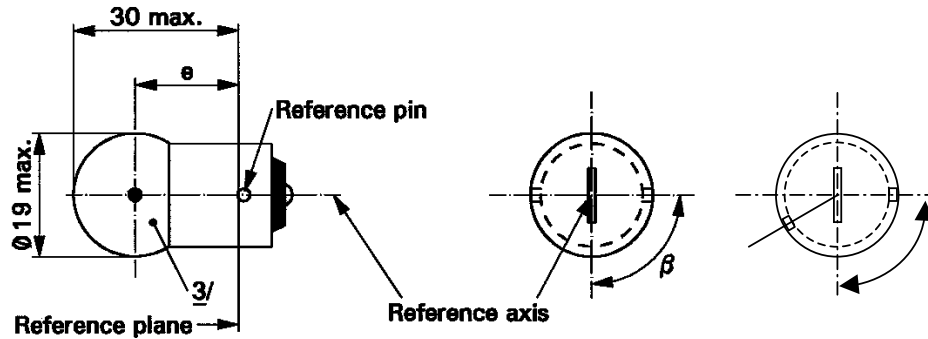
Test procedures and requirements.

1. The filament lamp is placed in a holder capable of being rotated about its axis and having either a calibrated scale or fixed stops corresponding to the angular displacement tolerance limits. The holder is then so rotated that an end view of the filament is seen on the screen on to which the image of the filament is projected. The end view of the filament shall be obtained within the angular displacements tolerance limits.
2. Side elevation
 The filament lamp placed with the cap down, the reference axis vertical and the filament seen end-on, the projection of the filament shall lie entirely within a rectangle of height "a" and width "b", having its centre at the theoretical position of the centre of the filament.
3. Front elevation
 The filament lamp placed with the cap down and the reference axis vertical, the filament lamp being viewed in a direction at right angles to the filament axis:
 - 3.1. The projection of the filament shall lie entirely within a rectangle of height "a" and width "h", having its centre at the theoretical position of the centre of the filament.
 - 3.2. The centre of the filament shall not be offset by more than distance "k" from the reference axis.

CATEGORY R5W and RR5W

Sheet R5W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



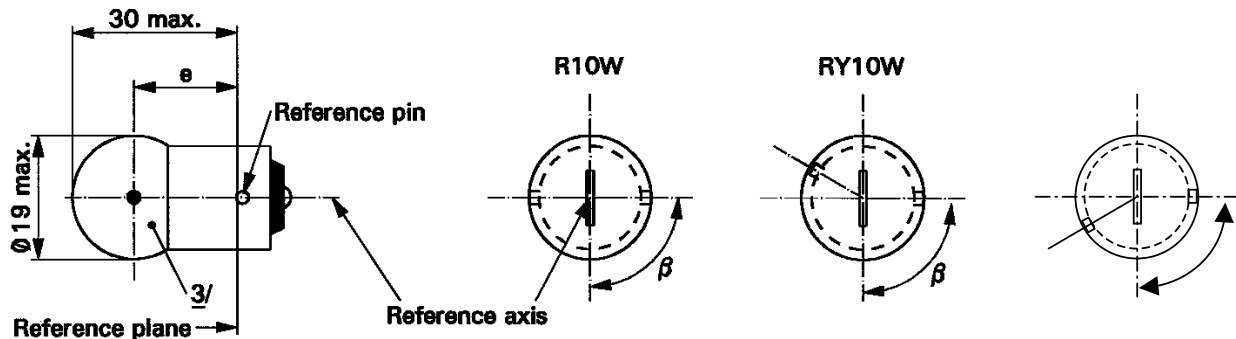
Dimensions in mm	Filament lamps of normal production			Standard filament lamp	
	min.	nom.	max.	<u>4/</u>	
e	17.5	19.0	20.5	19.0 ± 0.3	
Lateral deviation <u>2/</u>			1.5	0.3 max.	
β	60°	90°	120°	90° ± 5°	
Cap: R5W: BA15s RR5W: BAW15s	in accordance with IEC Publication 60061			(sheet 7004-11A-9) <u>1/</u> (sheet 7004-...-1)	
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	6 <u>5/</u>	12	24	12
	Watts	5			5
Test voltage	Volts	6.75	13.5	28.0	13.5
Objective values	Watts	5.5 max.		7.7 max.	5.5 max.
	Luminous flux	R5W	50 ± 20 %		
		RR5W	<u>5/</u>	12 ± 25 %	
Reference luminous flux at approximately 13.5 V:	White: 50 lm Red: 12 lm				

- 1/ Filament lamps with cap BA15d may be used for special purposes; they have the same dimensions.
- 2/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis of the reference pin.
- 3/ The light emitted from filament lamps of normal production shall be white for category R5W and red for category RR5W. (See also note 4/.)
- 4/ The light emitted from standard filament lamps shall be white for category R5W; white or red for category RR5W.
- 5/ Within RR5W no 6 V rated voltage type specified .

CATEGORIES R10W, RY10W AND RR10W

Sheet R10W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



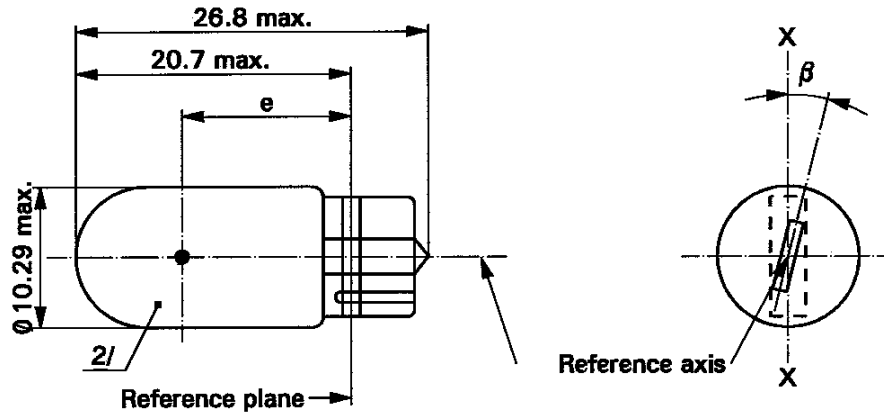
Dimensions in mm		Filament lamps of normal production			Standard filament lamp	
		min.	nom.	max.	<u>4/</u>	
E		17.5	19.0	20.5	19.0 ± 0.3	
Lateral deviation	<u>2/</u>			1.5	0.3 max.	
β		60°	90°	120°	90° ± 5°	
R10W: BA15s Cap: RY10W: BAU 15s in accordance with IEC Publication 60061 RR10W: BAW15s					(sheet 7004-11A-9) <u>1/</u> (sheet 7004-19-1) (sheet 7004-...-1)	
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values		Volts	6 <u>5/</u>	12	24	12
		Watts	10			10
Test voltage		Volts	6.75	13.5	28	13.5
Objective values	Watts	R10W RY10W	11 max.		14 max.	11 max.
		RR10W	<u>5/</u>	11 max.		11 max.
	Luminous flux	R10W	125 ± 20 %			
		RY10W	75 ± 20 %			
RR10W		<u>5/</u>	30 ± 25 %			
Reference luminous flux at approximately 13.5 V:		White: 125 lm Amber: 75 lm Red: 30 lm				

- 1/ Filament lamps R10W with cap BA15d may be used for special purposes; they have the same dimensions.
- 2/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis of the reference pin.
- 3/ The light emitted from filament lamps of normal production shall be white for category R10W, amber for category RY10W and red for category RR10W. (See also note 4/.)
- 4/ The light emitted from standard filament lamps shall be white for category R10W; white or amber for category RY10W; white or red for category RR10W.
- 5/ Within RR10W no 6 V rated voltage type specified.

CATEGORY W5W, WY5W and WR5W

Sheet W5W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



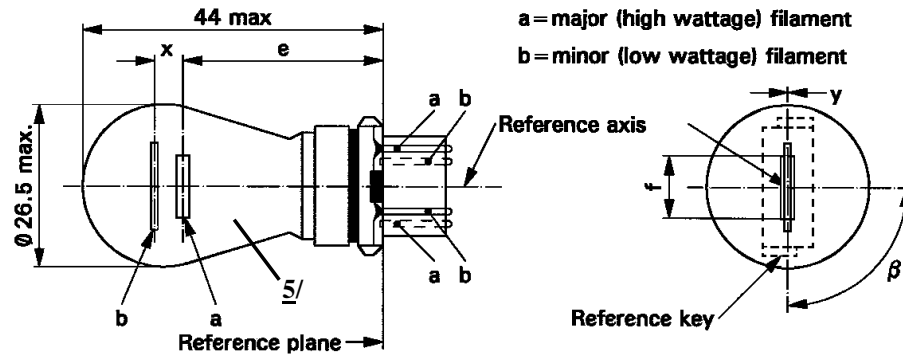
Dimensions in mm		Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	<u>3/</u>
e		11.2	12.7	14.2	12.7 ± 0.3
Lateral deviation	<u>1/</u>			1.5	0.5 max.
β		- 15°	0°	+ 15°	0° ± 5°
Cap W2.1x9.5d in accordance with IEC Publication 60061 (sheet 7004-91-3)					
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	6 <u>4/</u>	12	24	12
	Watts	5			5
Test voltage	Volts	6.75	13.5	28.0	13.5
Objective values	Watts	5.5 max.		7.7 max.	5.5 max.
	Luminous flux	W5W	50 ± 20 %		
		WY5W	30 ± 20 %		
WR5W	<u>4/</u>	12 ± 25 %			
Reference luminous flux at approximately 13.5 V:		White: 50 lm Amber: 30 lm Red: 12 lm			

- 1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing axis X-X.
- 2/ The light emitted from filament lamps of normal production shall be white for category W5W, amber for category WY5W and red for category WR5W. (See also note 3/.)
- 3/ The light emitted from standard filament lamps shall be white for category W5W; white or amber for category WY5W; white or red for category WR5W.
- 4/ Within WR5W no 6 V rated voltage type specified .

CATEGORY PY27/7W

Sheet PY27/7W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



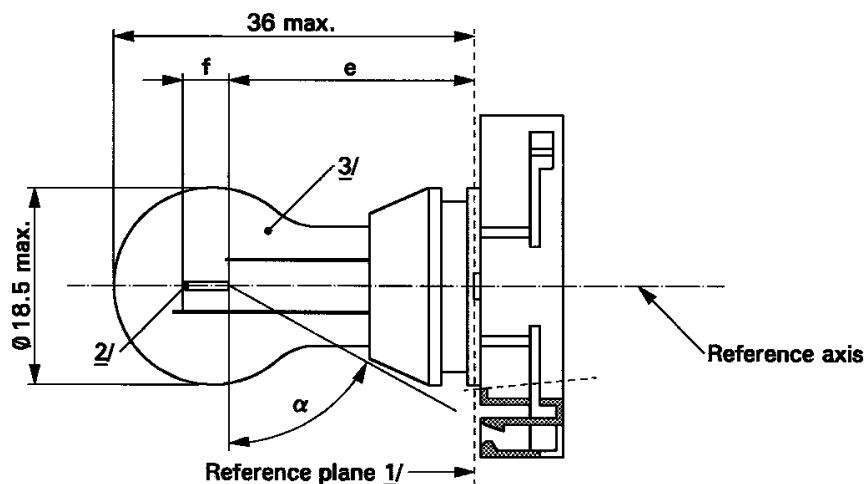
Dimensions in mm	Filament lamps of normal production			Standard filament lamp	
	min.	nom.	max.	6/	
e		27.9 3/		27.9 ± 0.3	
f			9.9	9.9 + 0/ - 2	
Lateral deviation 2/			3/	0.0 ± 0.4	
x 4/		5.1 3/		5.1 ± 0.5	
y 4/		0.0 3/		0.0 ± 0.5	
β	75° 3/	90°	105° 3/	90° ± 5°	
Cap WX2.5x16q in accordance with IEC Publication 60061 (sheet 7004-104A-1)					
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	12		12	
	Watts	27	7	27	7
Test voltage	Volts	13.5		13.5	
Objective values	Watts	32.1 max.	8.5 max.	32.1 max.	8.5 max.
	Luminous flux	280 ± 15 %	21 ± 15 %		
Reference luminous flux at approximately 13.5 V:	White: 475 and 36 lm Amber: 280 and 21 lm				

- 1/ The reference axis is defined with respect to the reference keys and is perpendicular to the reference plane.
- 2/ Maximum lateral deviation of the major (high wattage) filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis through the reference keys.
- 3/ To be checked by means of a "box-system", sheets P27/7W/2 and 3.
- 4/ "x" and "y" denote the offset of the axis of the minor (low wattage) filament with respect to the axis of the major (high wattage) filament.
- 5/ The light emitted from filament lamps of normal production shall be amber. (See also note 6/)
- 6/ The light emitted from standard filament lamps shall be amber or white.

CATEGORIES P19W, PY19W, PR19W, PS19W, PSY19W AND PSR19W

Sheet P19W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



- 1/ The reference plane is defined by the meeting points of the cap-holder fit.
- 2/ No actual filament diameter restrictions apply but the objective is $d_{max} = 1.1$ mm.
- 3/ The light emitted from normal production lamps shall be white for categories P19W and PS19W; amber for categories PY19W and PSY19W; red for categories PR 19W and PSR 19W. (See also note 8/)

CATEGORIES P19W, PY19W, PR19W, PS19W, PSY19W AND PSR19W**Sheet P19W/2**

Dimensions in mm	<u>4/</u>	Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	<u>8/</u>
e	<u>5/</u> <u>6/</u>		24.0		24.0
f	<u>5/</u> <u>6/</u>		4.0		4.0 ± 0.2
α	<u>7/</u>	61.5°			61.5° min.
P19W Cap PGU20-1 PY19W Cap PGU20-2 PR19W Cap PGU20-5 PS19W Cap PG20-1 PSY19W Cap PG20-2 PSR19W Cap PG20-5		in accordance with IEC Publication 60061 (sheet 7004-127-1)			
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	12			12
	Watts	19			19
Test voltage	Volts	13.5			13.5
Objective values	Watts		20 max.		20 max.
	Luminous flux	P19W PS19W	350 ± 15 %		
		PY19W PSY19W	215 ± 20 %		
		PR19W PSR19W	80 ± 20 %		
Reference luminous flux at approximately 13.5 V		White: 350 lm Amber: 215 lm Red: 80 lm			

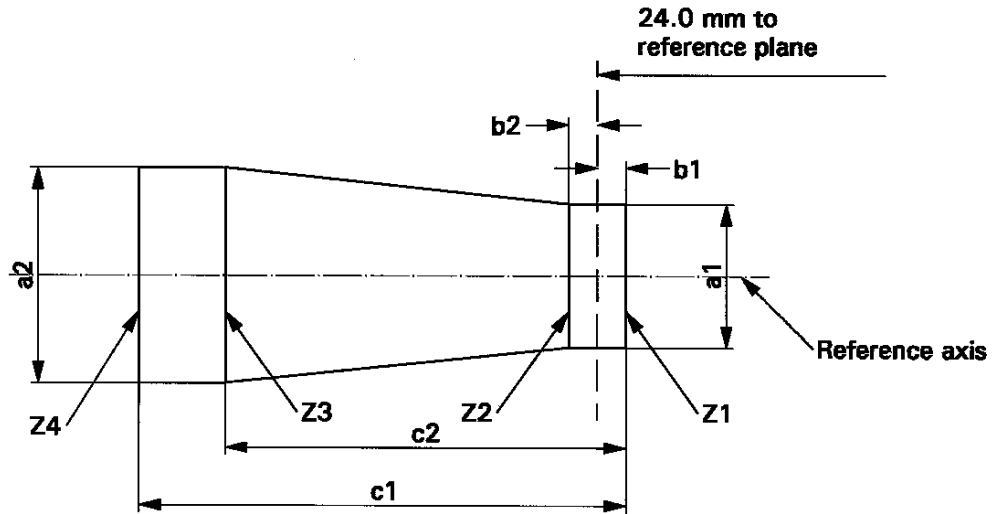
- 4/ For categories PS19W, PSY19W and PSR19W, dimensions shall be checked with O-ring removed.
- 5/ The filament position is checked by means of a "box-system"; sheet P19W/3.
- 6/ The ends of the filament are defined as the points where, when the viewing direction is perpendicular to the plane through the filament lead-in wires as showed in the drawing on sheet P19W/1, the projection of the outside of the end turns crosses the filament axis.
- 7/ No part of the cap beyond to the reference plane shall interfere with angle α. The bulb shall be optically distortion free within the angle 2α + 180°.
- 8/ The light emitted from standard filament lamps shall be white for categories P19W and PS19W; white or amber for categories PY19W and PSY19W; white or red for categories PR19W and PSR19W.

CATEGORIES P19W, PY19W, PR19W, PS19W, PSY19W AND PSR19W

Sheet P19W/3

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and reference plane, whether a filament lamp complies with the requirements.



	a1	a2	b1, b2	c1	c2
Filament lamps of normal production	2.9	3.9	0.5	5.2	3.8
Standard filament lamps	1.5	1.7	0.25	4.7	3.8

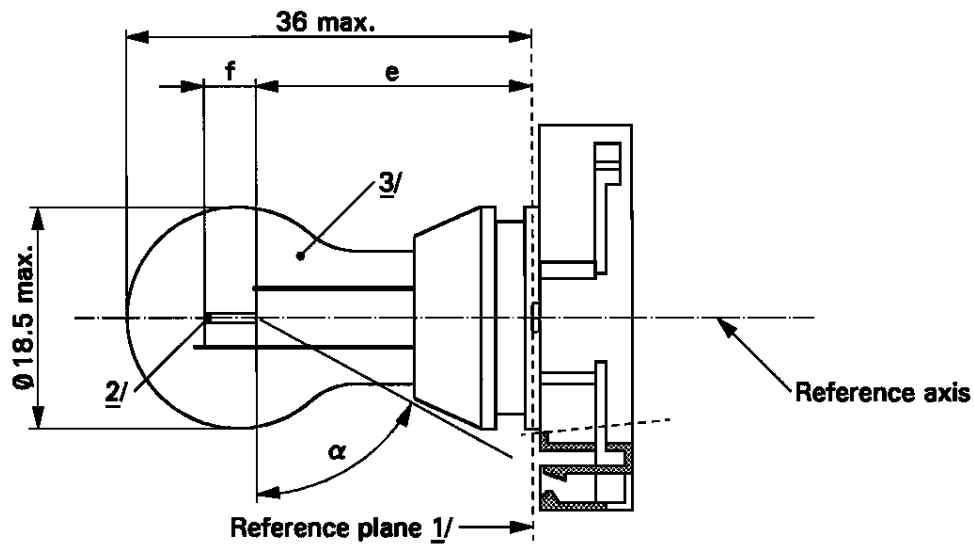
The filament position is checked in two mutually perpendicular planes, one of them being the plane through the lead-in wires.

The ends of the filament as defined on sheet P19W/2, note 6/, shall lie between Z1 and Z2 and between the lines Z3 and Z4

The filament shall lie entirely within the limits shown.

CATEGORIES P24W, PY24W, PR24W, PS24W, PSY24W AND PSR24W**Sheet P24W/1**

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



- 1/ The reference plane is defined by the meeting points of the cap-holder fit.
- 2/ No actual filament diameter restrictions apply but the objective is $d_{max} = 1.1$ mm.
- 3/ The light emitted from normal production lamps shall be white for categories P24W and PS24W; amber for categories PY24W and PSY24W; red for the categories PR24W and PSR24W. (See also note 8/)

CATEGORIES P24W, PY24W, PR24W, PS24W, PSY24W AND PSR24W

Sheet P24W/2

Dimensions in mm	<u>4/</u>	Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	<u>8/</u>
e	<u>5/</u> <u>6/</u>		24.0		24.0
f	<u>5/</u> <u>6/</u>		4.0		4.0 ± 0.2
α	<u>7/</u>	61.5°			61.5° min.
P24W Cap PGU20-3 PY24W Cap PGU20-4 PR24W Cap PGU20-6 PS24W Cap PG20-3 PSY24W Cap PG20-4 PSR24W Cap PG20-6		in accordance with IEC Publication 60061 (sheet 7004-127-1)			
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	12			12
	Watts	24			24
Test voltage	Volts	13.5			13.5
Objective values	Watts		25 max.		25 max.
	Luminous flux	P24W PS24W	500 +10/-20 %		
		PY24W PSY24W	300 +15/-25 %		
		PR24W PSR24W	115 +15/-25 %		
Reference luminous flux at approximately 13.5 V		White: 500 lm Amber: 300 lm Red: 115 lm			

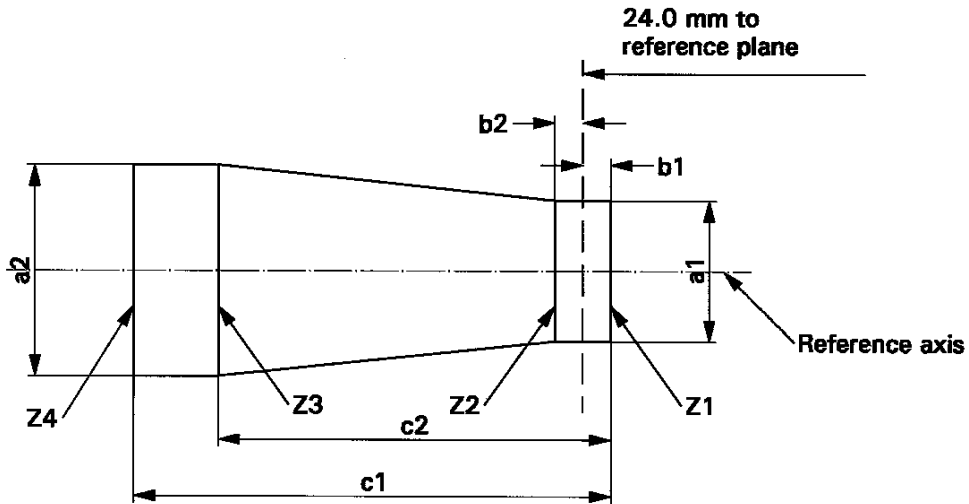
- 4/ For categories PS24W, PSY24W and PSR24W, dimensions shall be checked with O-ring removed.
- 5/ The filament position is checked by means of a "box-system"; sheet P24W/3.
- 6/ The ends of the filament are defined as the points where, when the viewing direction is perpendicular to the plane through the filament lead-in wires as showed in the drawing on sheet P24W/1, the projection of the outside of the end turns crosses the filament axis.
- 7/ No part of the cap beyond to the reference plane shall interfere with angle α. The bulb shall be optically distortion free within the angle 2α + 180°.
- 8/ The light emitted from standard filament lamps shall be white for categories P24W and PS24W; white or amber for categories PY24W and PSY24W; white or red for categories PR24W and PSR24W.

CATEGORIES P24W, PY24W, PR24W, PS24W, PSY24W AND PSR24W

Sheet P24W/3

Screen projection requirements

This test is used to determine, by checking whether the filament is correctly positioned relative to the reference axis and reference plane, whether a filament lamp complies with the requirements.



	a1	a2	b1, b2	c1	c2
Filament lamps of normal production	2.9	3.9	0.5	5.2	3.8
Standard filament lamps	1.5	1.7	0.25	4.7	3.8

The filament position is checked in two mutually perpendicular planes, one of them being the plane through the lead-in wires.

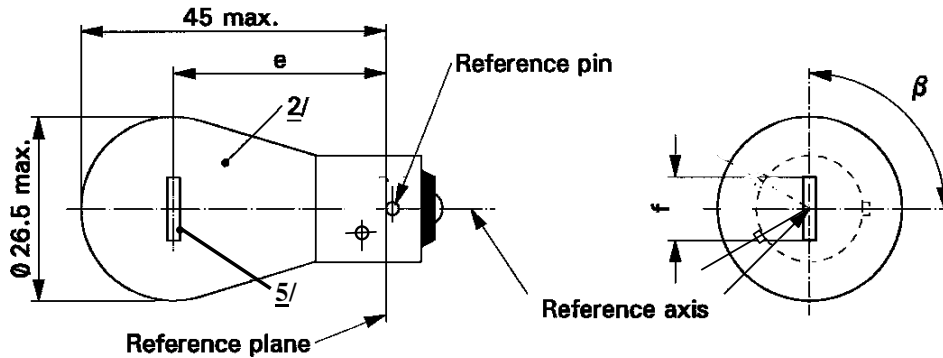
The ends of the filament as defined on sheet P24W/2, note 6/, shall lie between Z1 and Z2 and between the lines Z3 and Z4.

The filament shall lie entirely within the limits shown.

CATEGORY PR21W

Sheet PR21W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



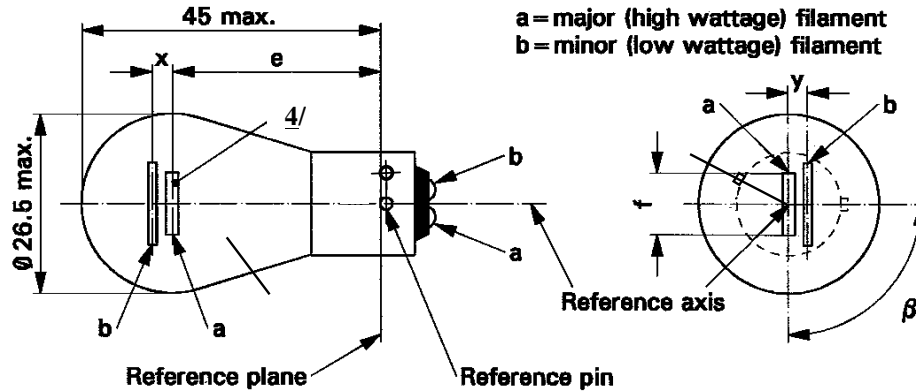
Dimensions in mm		Filament lamps of normal production			Standard filament lamp
		min.	nom.	max.	4/
e	12 V		31.8 3/		31.8 ± 0.3
	24 V	30.8	31.8	32.8	
f	12 V	5.5	6.0	7.0	6.0 ± 0.5
Lateral 1/ deviation	12 V			3/	0.3 max
	24 V			1.5	
β		75°	90°	105°	90° ± 5°
Cap BAW15s in accordance with IEC Publication 60061 (sheet 7004-...-1)					
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS					
Rated values	Volts	12	24	12	
	Watts	21			21
Test voltage	Volts	13.5	28.0		
Objective values	Watts	26.5 max.	29.7 max.	26.5 max.	
	Luminous flux	110 ± 20 %			
Reference luminous flux at approximately 13.5 V:		White:	460 lm		
		Red:	110 lm		

- 1/ Maximum lateral deviation of filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis of the reference pin.
- 2/ The light emitted from normal production lamps shall be red (See also note 4/).
- 3/ To be checked by means of a "box system", sheet P21W/2.
- 4/ The light emitted from standard filament lamps shall be white or red.
- 5/ In this view the filament of the 24 V type may be straight or V-shaped. This shall be indicated in the application of approval. If it is straight, the screen projection requirements, sheet P21W/2, apply. If it is V-shaped, the filament ends shall be at the same distance within ± 3 mm from the reference plane.

CATEGORY PR21/4W

Sheet PR21/4W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



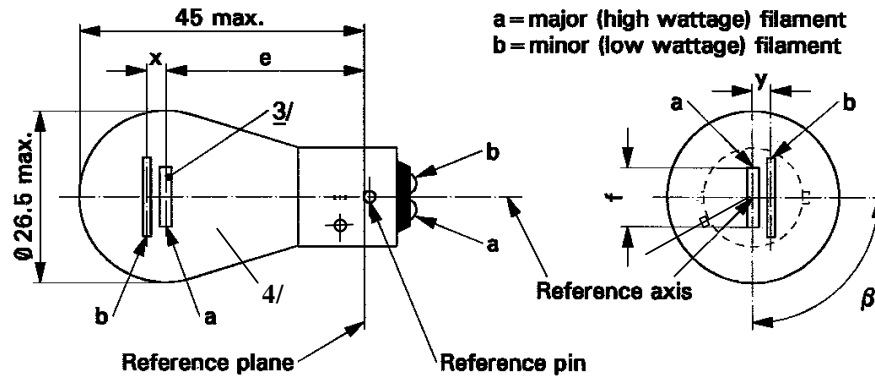
Dimensions in mm	Filament lamps of normal production <u>5/</u>			Standard filament lamp		
	min.	nom.	max.	<u>6/</u>		
e		31.8 <u>1/</u>		31.8 ± 0.3		
f			7.0	7.0 + 0/- 2		
Lateral deviation			<u>1/</u>	0.3 max. <u>2/</u>		
x,y	<u>1/</u>			2.8 ± 0.5		
β	75° <u>1/</u>	90° <u>1/</u>	105° <u>1/</u>	90° ± 5°		
Cap BAU15d in accordance with IEC Publication 60061 (sheet 7004-19-2)						
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values	Volts	12		24 <u>4/</u>	12	
	Watts	21	4	21	4	21/4
Test voltage	Volts	13.5		28.0	13.5	
Objective values	Watts	26.5 max.	5.5 max.	29.7 max.	8.8 max.	26.5/5.5 max.
	Luminous flux ± %	105	4	105	5	
Reference luminous flux at approximately 13.5 V:		White: 440 lm and 15 lm Red : 105 lm and 4 lm				

- 1/ These dimensions shall be checked by means of a "box-system" 3/ based on the dimensions and tolerances shown above. "x" and "y" refer to the major (high-wattage) filament, not to the reference axis. Means of increasing the positioning accuracy of the filament and of the cap-holder assembly are under consideration.
- 2/ Maximum lateral deviation of the major filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis of the reference pin.
- 3/ The "Box-System" is the same as for filament lamp P21/5W.
- 4/ The 24-Volt filament lamp is not recommended for future embodiments.
- 5/ The light emitted from normal production lamps shall be red (See also note 6/).
- 6/ The light emitted from standard filament lamps shall be white or red.

CATEGORY PR21/5W

Sheet PR21/5W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



Dimensions in mm		Filament lamps of normal production 4/			Standard filament lamp	
		min.	nom.	max.	5/	
e	12 V		31.8 1/		31.8 ± 0.3	
	24 V	30.8	31.8	32.8		
f	12 V			7.0	7.0 + 0/- 2	
Lateral deviation 2/	12 V			1/	0.3 max.	
	24 V			1.5		
x, y	12 V		1/		2.8 ± 0.3	
x	24 V 3/	-1.0	0	1.0		
y	24 V 3/	1.8	2.8	3.8		
β		75°	90°	105°	90° ± 5°	
Cap BAW15d in accordance with IEC Publication 60061 (sheet 7004-...-1)						
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values	Volts	12		24		12
	Watts	21	5	21	5	21/5
Test voltage	Volts	13.5		28.0		13.5
Objective values	Watts	26.5 max.	6.6 max.	29.7 max.	11.0 max.	26.5 and 6.6 max.
	Luminous flux ± %	105	8	105	10	
		20	25	20	25	
Reference luminous flux at approximately 13.5 V:		White: 440 lm and 35 lm Red: 105 lm and 8 lm				

1/ See footnote 1/ on sheet P21/5W/2

2/ See footnote 2/ on sheet P21/5W/2

3/ See footnote 3/ on sheet P21/5W/2

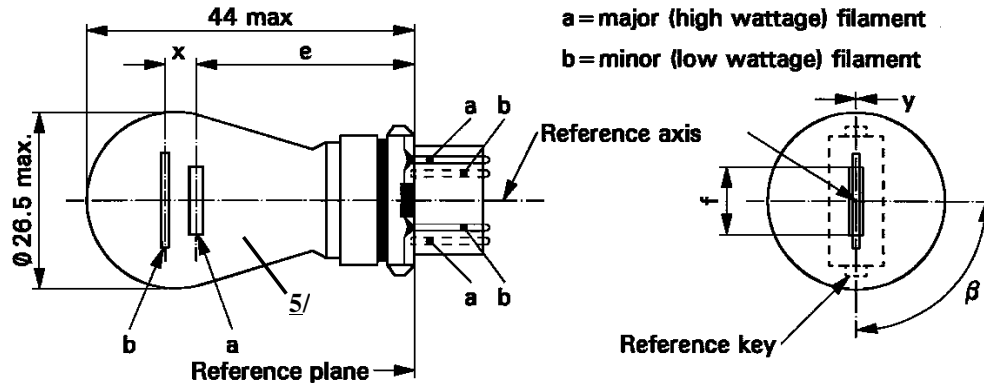
4/ The light emitted from normal production lamps shall be red (See also note 5/).

5/ The light emitted from standard filament lamps shall be white or red.

CATEGORY PR27/7W

Sheet PR27/7W/1

The drawings are intended only to illustrate the essential dimensions (in mm) of the filament lamp



Dimensions in mm	Filament lamps of normal production			Standard filament lamp		
	min.	nom.	max.	6/		
e		27.9 3/		27.9 ± 0.3		
f			9.9	9.9 + 0/ - 2		
Lateral deviation 2/			3/	0.0 ± 0.4		
x 4/		5.1 3/		5.1 ± 0.5		
y 4/		0.0 3/		0.0 ± 0.5		
β	75° 3/	90°	105° 3/	90° ± 5°		
Cap WU2.5x16 in accordance with IEC Publication 60061 (sheet 7004-...-1)						
ELECTRICAL AND PHOTOMETRIC CHARACTERISTICS						
Rated values	Volts	12			12	
	Watts	27	7		27	7
Test voltage	Volts	13.5			13.5	
Objective values	Watts	32.1 max.	8.5 max.		32.1 max.	8.5 max.
	Luminous flux	110 ± 20 %		9 ± 20 %		
Reference luminous flux at approximately 13.5 V:	White: 475 and 36 lm Red: 110 and 9 lm					

- 1/ The reference axis is defined with respect to the reference keys and is perpendicular to the reference plane.
- 2/ Maximum lateral deviation of the major (high wattage) filament centre from two mutually perpendicular planes both containing the reference axis and one containing the axis through the reference keys.
- 3/ To be checked by means of a "box system", sheets P27/7W/2 and 3.
- 4/ "x" and "y" denote the offset of the axis of the minor (low wattage) filament with respect to the axis of the major (high wattage) filament.
- 5/ The light emitted from normal production lamps shall be red (See also note 6/).
- 6/ The light emitted from standard filament lamps shall be white or red