



Radium
Die Lichtmarke



Traditional
Lamps

Radium – Pioneer of Light.

**The Big Catalogue of
Classic Lamps.**

An aerial photograph of the town of Wipperfürth, Germany, showing a mix of residential houses and industrial buildings. The Radium factory complex is prominent in the lower center, featuring a tall brick chimney and several large white industrial buildings. The town is surrounded by green trees.

Radium.

Lampenwerk Wipperfürth.

Pioneer of Electrical Light

Radium has been the specialist trade brand for light since 1904 and is Germany's oldest active lamp manufacturer. With its headquarters in the heart of the German lighting industry, Radium is well connected in the industry and with around 200 employees also an important employer in the region. At the production site in Wipperfürth, lamps are produced in large numbers on high-tech production lines, as well as very complex special lamps in small batches.

The brand Radium has got an excellent reputation and is known by professional customers for outstanding quality and first-class customer service. In terms of sales, Radium relies on cooperation with specialist retailers and continues to expand international relationships. As one of the few remaining manufacturers of traditional lamps and equipped with decades of experience in the field of lighting, Radium offers the perfect conditions to scale the business sustainably and to occupy new business fields.

These are times of change - for Radium Lampenwerk GmbH as well as for our partners such as electrical wholesalers, but also for the entire market.

The long-established principle of lamp and luminaire is increasingly questioned and is being replaced by complete and complex LED solutions more and more. So, in the future it will also always be our task to recognize change and transformation, and approach it proactively. This is the only way we can develop new opportunities, manufacture professional and innovative products and offer personal service to you.

Radium stands up to this transformation in order to help shaping it and thus also uses the opportunity to change: Our current brand identity represents our look ahead. At its core, Radium continues to rely on the strengths that could ever and always be identified by. We combine the advantages of our many years of experience with the flexibility of a medium-sized company.

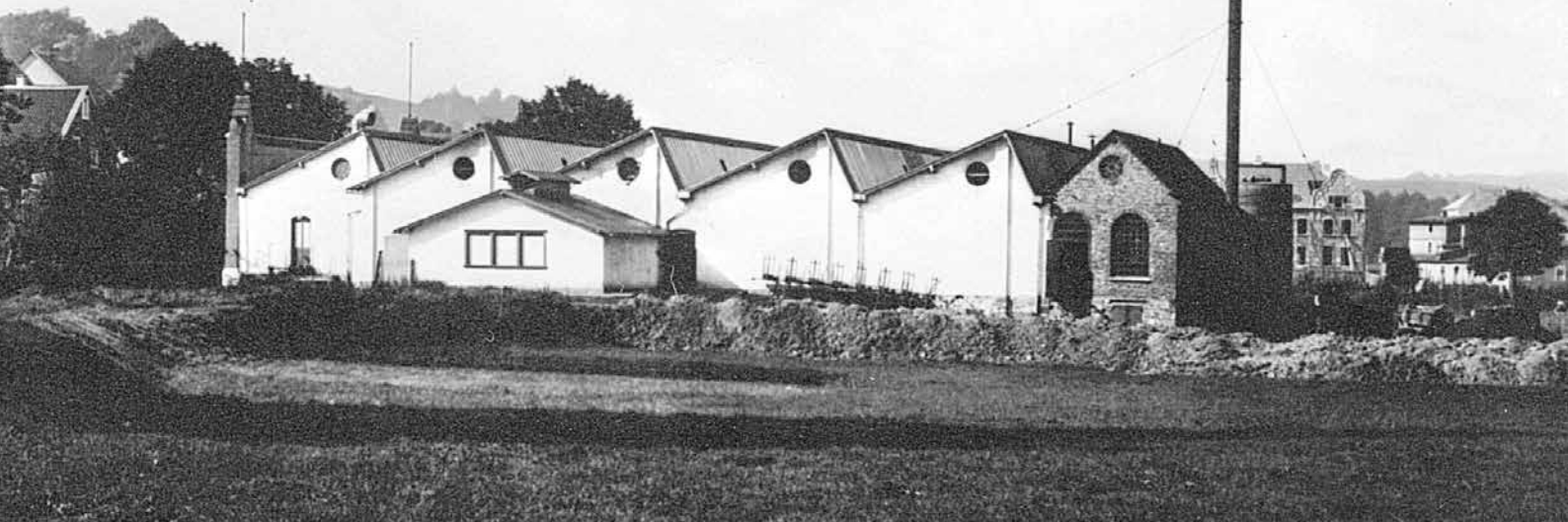
You will experience us as a highly motivated team with excellent employees. We look forward to this change and are very proud to be starting a 'bright and radiant' future with you. But enough of the words now, we would like to invite you to get to know Radium on these pages!

Radium bleibt Radium

Content

History	04
Innovation and Environment	06
General Notes	07
Incandescent and Tungsten Halogen Lamps	08
Mains Voltage Lamps with Omni-directional Radiation	10
Low Voltage Lamps with Omni-directional Radiation	14
Low Voltage Lamps with Reflectors	16
Low Pressure Discharge Lamps	22
Compact Fluorescent Lamps	24
Fluorescent Lamps	30
High Pressure Discharge Lamps	44
Metal Halide Lamps with Ceramic Burner	46
Metal Halide Lamps with Quartz Burner	50
HRI Aquastar	55
High Pressure Sodium Vapour Lamps	62
Signal Lamps and Non-EU Lamps without CE Marking	76
Signal Lamps	77
Non-EU Lamps without CE Marking	81
Pictograms, other Icons and Notes	84

More than one century of lamp history. **History.**



From Spinning Mill to Lamp Factory

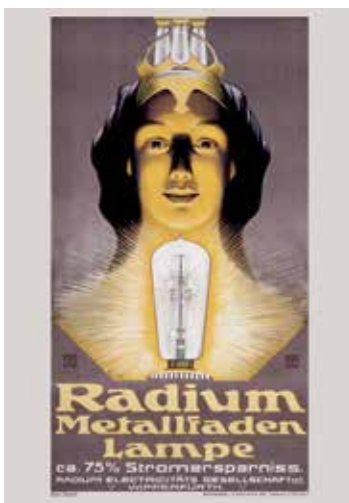
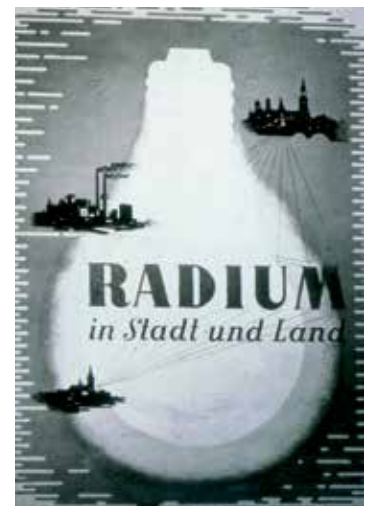
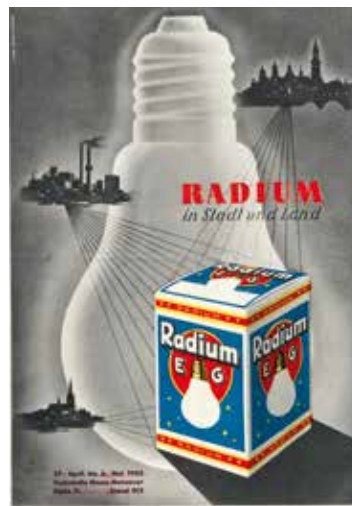
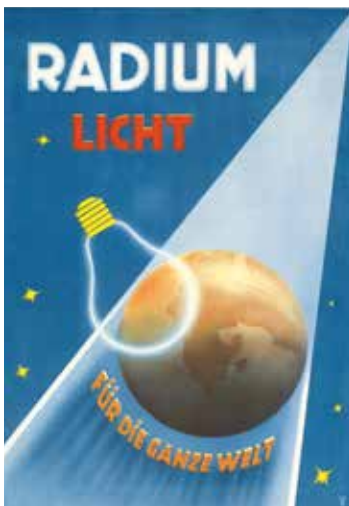
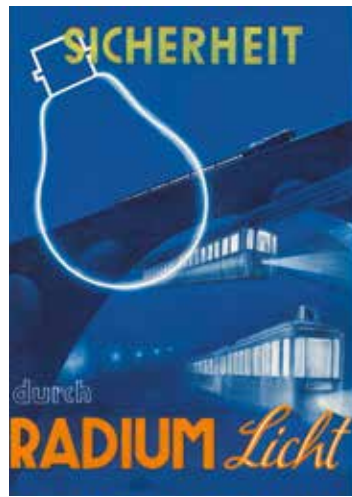
In 1902, a major fire destroyed the spinning company Drecker & Kuhlmann which was situated just outside the town of Wipperfürth. Then, on January 29th 1904 the entrepreneur Drecker founded together with Adolf Berrenberg – an employee of Edison in the U.S. – the Berrenberg-Elektrizitätswerke GmbH. On December 17th 1904 Richard Drecker has re-named the company with his new partner Richard Kersting to Radium-Elektricitäts-Gesellschaft m.b.H. ('Radium electrical society ltd.').

In 1907, Eugen Kersting, son of Richard Kersting, joins the enterprise and he takes over the company together with Richard Drecker after his father's death in 1917. Under the technical direction and supervision of Eugen Kersting Radium experiences a rapid and great rise in the following years.

Even after the death of Eugen Kersting Radium has been involved in essential developments of lamp technology. In 1967, the first colour TV show was broadcasted in Germany. Thanks to the colour TV compatible lighting from Wipperfürth „Der goldene Schuss“ ('the golden shot') can be broadcasted in colour. As well, for the Olympic Games 1972 in Munich Radium has provided a new lamp type and fit each and every one sports complex with those lamps.

Today, at Radium many different lamp types are manufactured on either high tech manufacturing lines – from special single-unit productions to high volume series of some million parts.

For almost 120 years, Radium has been a strong partner of the specialised trade, and all over the world, lamps from Radium can be obtained at specialised trade shops, only. By now, Radium has got partners in over 60 countries and sends light from Wipperfürth into the whole world.



Eröffnungsbilanz

Aktiva	
1. Bank d. Reichsbank	10000,-
2. Bank d. Reichsbank	10000,-
3. Bank d. Reichsbank	10000,-
4. Bank d. Reichsbank	10000,-
5. Bank d. Reichsbank	10000,-
6. Bank d. Reichsbank	10000,-
7. Bank d. Reichsbank	10000,-
8. Bank d. Reichsbank	10000,-
9. Bank d. Reichsbank	10000,-
10. Bank d. Reichsbank	10000,-
Gesamt	100000,-

Passiva	
1. Bank d. Reichsbank	10000,-
2. Bank d. Reichsbank	10000,-
3. Bank d. Reichsbank	10000,-
4. Bank d. Reichsbank	10000,-
5. Bank d. Reichsbank	10000,-
6. Bank d. Reichsbank	10000,-
7. Bank d. Reichsbank	10000,-
8. Bank d. Reichsbank	10000,-
9. Bank d. Reichsbank	10000,-
10. Bank d. Reichsbank	10000,-
Gesamt	100000,-

Eröffnungsbilanz
 Dr. Eugen Kersting

Opening balance sheet

Dr. Eugen Kersting



High quality and sustainability.

Innovation and Environment.

Quality as a permanent process

To converse the thought of quality into action, this has been Radium's motor of success for more than 115 years. Very important factors for reaching the high quality standards – parts of our lamps are being manufactured here, the know-how of the development of production processes up to the construction of the machinery – are provided in our enterprise and are always being held up to date. Thus Radium is able to manufacture products of high guaranteed quality, which starts with the individual fabrication of small quantities up to the fabrication of big series. The quality management is on an excellent level. The aim of the staff is to maintain this level by acting consciously every day. The certification according to DIN ISO 9001 is at the same time a confirmation as well as a further motivation. Radium vouches for quality.

Environmental Protection is our focus

Quality and environmental protection belong together! Active protection of the environment is a basis in our society for securing the future and a part of our responsibility for the following generations – as well in the private field as in the business field. We at Radium see ourselves responsible for protecting the environment by saving and carefully using natural resources. Already in 1991, this corporate policy was laid down in the guiding principles for environmental protection. In its core statement, the company committed themselves to the protection of the environment. In 1997, this Code of Ecological Management was inspected in accordance with the EC Eco Audit Regulation and certified in accordance with DIN EN 14001.

By using energy saving products everybody can contribute to climate and environment protection. By taking premium energy saving lamps you do not just save energy. Efficient lamp technologies take care of our resources and, therefore, support the decrease in exhaustion of greenhouse gas carbon dioxide.



Products with Claim.

General Notes.

Information regarding Purchase, Delivery and Operation

The technical design data are in accordance with DIN and IEC. The producer does not take any responsibility for damage to persons or property in case of unsuitable operation or handling of the product.

A prerequisite to the faultless performance of electric light sources throughout their whole life time is the installation of a suitable fuse. Please, observe DIN 49820 and the instructions on the lamp packing. Operating data and dimensions are valid within the usual tolerances.

If Radium lamps are operated with ignitors and ballasts which are not approved by Radium for that particular lamp type, Radium rejects any liability or warranty for these lamps. Information about approved ignitors and ballasts for a particular lamp type can be obtained from the manufacturer of these devices.

On request, models not specified herein, in addition to differing bases and voltages, are available. Sale and delivery are effected in accordance with the Radium Terms of Delivery and Payment valid on the day of conclusion of contract.

Packing units offer economical advantages to the purchase and logistics department. Please match your quantity volume accordingly. For orders of a minimum quantity (clefts), we will invoice you with an additional charge of 10 % for each case where the ordered number is below the volume of one packaging unit. Technical changes and terms of delivery are reserved.

Manipulation of any kind to packaging or product is not permissible as this will violate Radium brand rights. Furthermore, technical properties of the product can change to its disadvantage or even destruction.

Therefore, Radium cannot be responsible for consequential damages.

® = Registered trademark

Radium®
Radium HRL®
Bonlux®
Ralux®
Spectralux®
RaLEDina®
Xeradex®

Subject to change without notice. Errors and omissions excepted.

For more information refer to www.radium.de.

Partners:

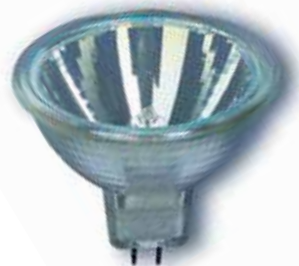


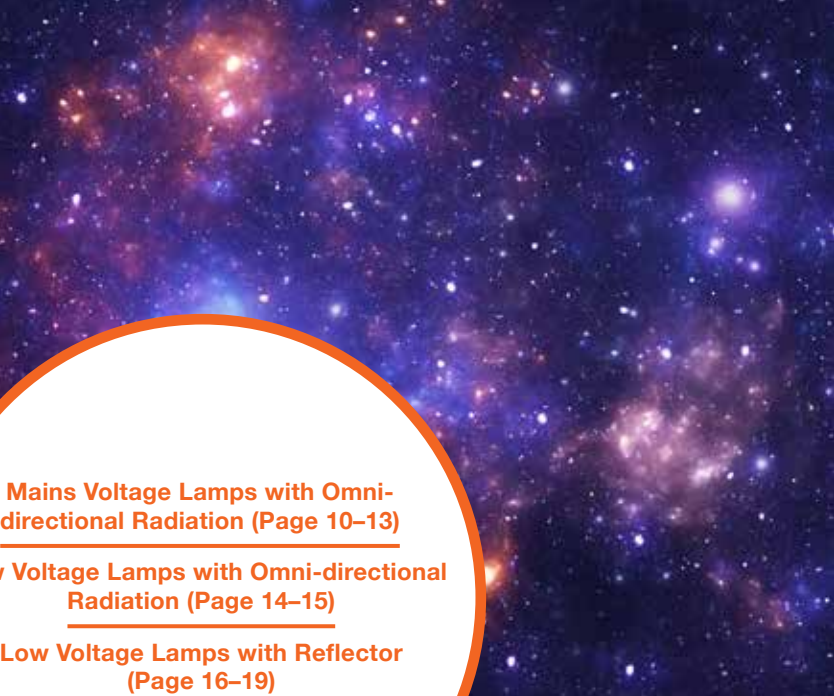
The Origin of Artificial Light. **Incandescent and Tungsten Halogen Lamps.**



Halogen and incandescent lamps are much more advanced than the carbon filament lamp, but this robust and easy-to-use type of lamp is now considered unsuitable for mass application due to its low energy efficiency. They are increasingly being ousted from the market by EU directives. You can find Radium LED replacement lamps at www.radium.de/led-lamps or in our LED lamp catalogue.

Yet they do have their charms: they provide very pleasant, warm light with perfect colour rendering and so they are also well tolerable even for light-sensitive people. Moreover, they do not contain any environmentally problematic substances and can therefore simply be disposed of with general household waste.





Mains Voltage Lamps with Omni-directional Radiation (Page 10–13)

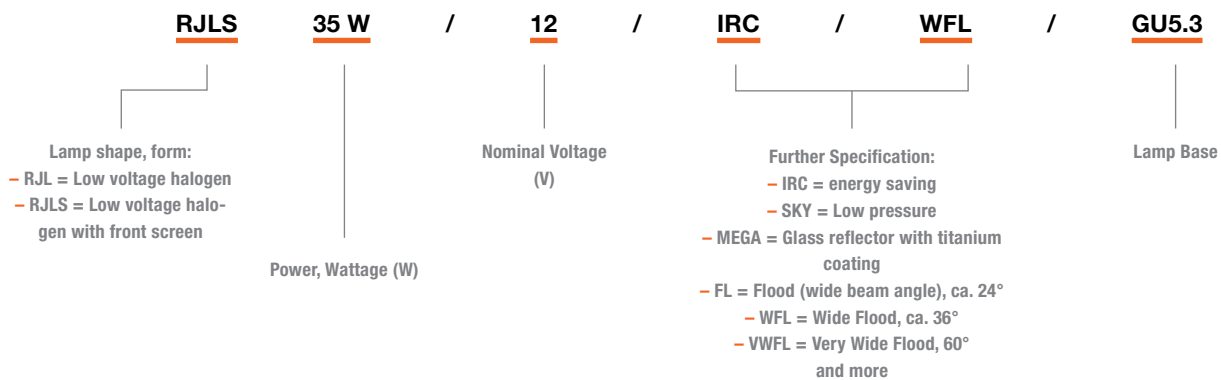
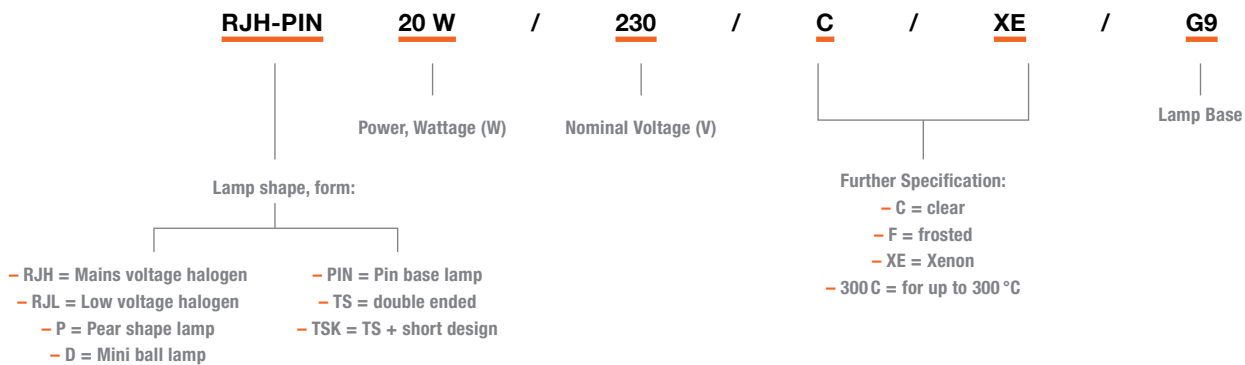
Low Voltage Lamps with Omni-directional Radiation (Page 14–15)

Low Voltage Lamps with Reflector (Page 16–19)

Technical Information (Page 20–21)



Notes on Naming Lamps (Codes for Lamp Types)



Mains Voltage Lamps with Omni-directional Radiation.

- 10 Ralopin
- 11 Oven lamps
- 11 Pear shape lamps
- 12 RZH-TSK Halogen R7s
- 12 RZH-TS Halogen R7s
- 13 RZH-TS Halogen R7s
- 13 RZL-TS Halogen R7s



d (mm) l (mm) pcs. from



G9 D 2000h 230

1	22318568	RZH-PIN 20W/230/C/XE/G9	20	235	14	43	20	01.09.2023
1	22318246	RZH-PIN 33W/230/C/XE/G9	33	460	14	43	20	01.09.2023
1	22318569	RZH-PIN 48W/230/C/XE/G9	48	740	14	43	20	01.09.2023
2	22318570	RZH-PIN 60W/230/C/XE/G9	60	980	14	51	20	01.09.2023

Incandescent lamps

Product features:

- Perfect colour rendering
- Unrestricted dimming
- Any burning position
- Operation in open fixtures



		d (mm)	l (mm)	pcs.	from

Oven lamps

E14	E	1000h	230	<300

1	19118593	P 15W/230/300C/C/E14	15	85	22	52	100	-
2	19118592	D 40W/240/300C/F/E14	40	400	45	78	50	-

		d (mm)	l (mm)	pcs.	from

Pear shape lamps

E14	E	1000h	230

3	19218595	P 15W/230/F/E14	15	110	26	57	100	01.09.2021
1	19218597	P 15W/230/C/E14	15	110	26	57	100	01.09.2021
1	19218598	P 25W/230/C/E14	25	190	26	57	100	01.09.2021

Further technical information from page 20.

Double ended halogen lamps

Product features:

- Perfect colour rendering
- Unrestricted dimming
- Innovative pinching technology
- Operation in enclosed luminaires



RJH-TSK Halogen R7s

d (mm) l (mm) pcs. from



R7s D 230 2000h any

1	22315792	RJH-TS 48W/230/C/XE/R7S	48	750	12	74.9	20	-
1	22315793	RJH-TS 80W/230/C/XE/R7S	80	1400	12	74.9	20	-
1	22315794	RJH-TSK 120W/230/C/XE/R7S	120	2250	12	74.9	20	-



RJH-TS Halogen R7s

d (mm) l (mm) pcs. from



R7s C 230 2000h any

2	22315795	RJH-TS 120W/230/C/XE/R7S	120	2250	12	114.2	20	-
2	22315796	RJH-TS 160W/230/C/XE/R7S	160	3160	12	114.2	20	01.09.2021
2	22315797	RJH-TS 230W/230/C/XE/R7S	230	5000	12	114.2	20	01.09.2021
2	22315799	RJH-TS 400W/230/C/XE/R7S	400	9000	12	114.2	20	01.09.2021

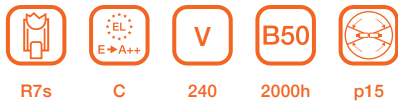


RJH-TS Halogen R7s

d (mm) l (mm) pcs. from



	R7s	C	V	B50	p15							
1	22315779		230	2000h		RJH-TS 750W/230/C/R7S	750	16500	12	185.7	12	01.09.2021
1	22315781		230	2000h		RJH-TS 1000W/230/C/R7S	1000	22000	12	185.7	12	01.09.2021
1	22317412		230	2000h		RJH-TS 1500W/230/C/R7S	1500	33000	12	250.7	12	01.09.2021
1	22317409		230	2000h		RJH-TS 2000W/230/C/R7S	2000	44000	12	327.4	12	01.09.2021



1	22315783		240	2000h		RJH-TS 1000W/240/C/R7S	1000	22000	12	185.7	12	01.09.2021
---	----------	--	-----	-------	--	-------------------------------	------	-------	----	-------	----	------------



RJL-TS Halogen R7s

d (mm) l (mm) pcs. from



2	22317413		42	2000h	any	RJL-TS 400W/42/C/R7S	400	9000	12	114.2	12	01.09.2021
---	----------	--	----	-------	-----	-----------------------------	-----	------	----	-------	----	------------

Further technical information from page 20.

Low Voltage Lamps with Omni-directional Radiation.

- 14 PIN Skylight IRC
- 15 PIN Skylight



PIN Skylight IRC

d (mm) l (mm) pcs. from



G4 B 4000h 12

1	22318333	RJL 14W/12/SKY/IRC/G4	14	240	10	33	40	01.09.2023
---	----------	------------------------------	----	-----	----	----	----	------------



GY6.35 B 4000h 12

2	22313223	RJL 35W/12/SKY/IRC/GY6.35	35	860	12	44	40	01.09.2023
2	22313224	RJL 50W/12/SKY/IRC/GY6.35	50	1180	12	44	40	01.09.2023
2	22314531	RJL 60W/12/SKY/IRC/GY6.35	60	1650	12	44	40	01.09.2023

Pin base lamps
















Product features:

- Perfect colour rendering
- Unrestricted dimming
- Any burning position
- Operation in open fixtures



PIN Skylight

d (mm) l (mm) pcs. from

											
	G4	C	4000h	6							
1	22311198		RJL 10W/6/SKY/G4			10	110	10	33	40	01.09.2023
											
	G4	C	2000h	12							
1	22319370		RJL 10W/12/SKY/G4			10	145	10	33	40	01.09.2023
1	22319371		RJL 20W/12/SKY/G4			20	375	10	33	40	01.09.2023
											
	GY6.35	C	2000h	12							
2	22319372		RJL 20W/12/SKY/GY6.35			20	375	12	44	40	01.09.2023
2	22319373		RJL 35W/12/SKY/GY6.35			35	765	12	44	40	01.09.2023
2	22319374		RJL 50W/12/SKY/GY6.35			50	1185	12	44	40	01.09.2023
2	22319376		RJL 90W/12/SKY/GY6.35			90	2380	12	44	40	01.09.2023

Further technical information from page 20.

Low Voltage Lamps with Reflector.

- 16 MR11 Mini-Mega
- 17 MR16 Mega IRC
- 17 MR16 Mega
- 17 MR16 Standard
- 18 AR111 Skylight IRC
- 18 AR70 Skylight
- 19 HTM Trafo



1



MR11 Mini-Mega

d (mm) l (mm) pcs. from



GU4 B 4000h 12

1	22312452	RJLS 20W/12/MEGA/WFL/GU4	20	220	700	36	35	40	10	01.09.2021
1	22312454	RJLS 35W/12/MEGA/WFL/GU4	35	480	1400	36	35	40	10	01.09.2021

Dichroic lamps

Product features:

- Operation in open fixtures
- Any burning position
- Perfect colour rendering
- Unrestricted dimming



MR16 Mega IRC

d (mm) l (mm) pcs. from



GU5.3 B 5000h 12

1	22318566	RJLS 14W/12/IRC/WFL/GU5.3	14	180	480	36	51	46	20	01.09.2021
1	22313226	RJLS 20W/12/IRC/WFL/GU5.3	20	300	1000	36	51	46	20	01.09.2021
1	22313227	RJLS 20W/12/IRC/VWFL/GU5.3	20	300	450	60	51	46	20	01.09.2021
1	22312456	RJLS 35W/12/IRC/FL/GU5.3	35	620	4100	24	51	46	20	01.09.2021
1	22312457	RJLS 35W/12/IRC/WFL/GU5.3	35	620	2200	36	51	46	20	01.09.2021
1	22312458	RJLS 35W/12/IRC/VWFL/GU5.3	35	620	1050	60	51	46	20	01.09.2021
1	22312460	RJLS 50W/12/IRC/FL/GU5.3	50	870	5300	24	51	46	20	01.09.2021
1	22312461	RJLS 50W/12/IRC/WFL/GU5.3	50	870	2850	36	51	46	20	01.09.2021



MR16 Mega

d (mm) l (mm) pcs. from



GU5.3 B 4000h 12

2	22311500	RJLS 20W/12/MEGA/WFL/GU5.3	20	250	780	36	51	46	20	01.09.2021
2	22311506	RJLS 35W/12/MEGA/WFL/GU5.3	35	550	1500	36	51	46	20	01.09.2021
2	22311514	RJLS 50W/12/MEGA/WFL/GU5.3	50	770	2200	36	51	46	20	01.09.2021



MR16 Standard

d (mm) l (mm) pcs. from



GU5.3 B 4000h 12

3	22310256	RJLS 20W/12/WFL/GU5.3	20	210	480	36	51	46	20	01.09.2021
3	22310257	RJLS 35W/12/WFL/GU5.3	35	430	1000	36	51	46	20	01.09.2021
3	22310258	RJLS 50W/12/WFL/GU5.3	50	680	1450	36	51	46	20	01.09.2021

Further technical information from page 20.

Lamps with metal reflector

Product features:

- Operation in open fixtures
- Any burning position
- Perfect colour rendering
- Unrestricted dimming



AR111 Skylight IRC

d (mm) l (mm) pcs. from



G53 B 4000h 12

1	22313637	RJL 35W/12/SKY/IRC/FL/G53	35	440	4200	24	111	67	6	01.09.2021
1	22313639	RJL 50W/12/SKY/IRC/FL/G53	50	680	5500	24	111	67	6	01.09.2021
1	22318199	RJL 50W/12/SKY/IRC/WFL/G53	50	680	2000	40	111	67	6	01.09.2021
1	22314532	RJL 60W/12/SKY/IRC/FL/G53	60	870	7000	24	111	67	6	01.09.2021



AR70 Skylight

d (mm) l (mm) pcs. from



BA15d C 4000h 12

2	22312217	RJL 50W/12/SKY/FL/BA15D	50	510	2600	24	71	50	10	01.09.2021
---	----------	--------------------------------	----	-----	------	----	----	----	----	------------

Transformers

Product features:

- Dimmable by leading and trailing edge phase-cut dimmer
- Compact design
- With strain relief for cables
- Electronically reversible short circuit and overload protection
- Radio interference suppression



HTM Transformer

l (mm) b (mm) h (mm) pcs.



230-240 0...+50 IP20

1	HT070421	HTM 70/230-240	20- 70	11.2-11.2	52	108	52	33	20
1	HT105421	HTM 105/230-240	35-105	11.3-11.4	43	108	52	33	20
2	HT150421	HTM 150/230-240	50-150	11.4-11.5	40	153	54	36	10

Further technical information from page 20.

Overview of Important Information.

Technical Information.

Lamp Bases (DIN-EN 60061-1)



E14

Sheet 7004-23-6



E27

Sheet 7004-21-10



BA15d

Sheet 7004-11B-7



R7s

Sheet 7004-92-3



G4

Sheet 7004-72-3



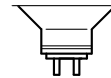
GY6.35

Sheet 7004-59-6



GU4

Sheet 7004-108-2



GU5.3

Sheet 7004-109-2



G53

Sheet 7004-134-1



G9

Sheet 7004-129-3



IRC Technology in low voltage halogen lamps

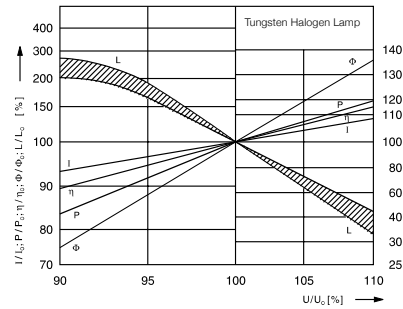
Lamps with IRC technology generate more light from less electric energy: The heat of IRC lamps is reflected back to the filament by the bulb coating (Infrared-reflective coating). Therefore, these lamps need less energy than standard halogen lamps.



Mains voltage and service life

Luminous flux and service life depend on the effective mains voltage in operation, as determined by the laws of physics.

The illustrations opposite show the relative dependence of life and luminance on the mains voltage.

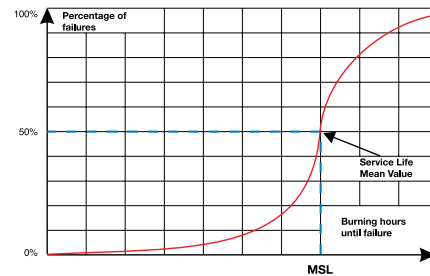


φ = luminous flux, P = Power, η = luminous efficiency, I = lamp current, L = service life



Mean service life

The average life MSL refers to the time when still 50% of the lamps are working. Individual lamps might fail before or after this time.



Operation in open fixtures

According to IEC 60598, operation in open fixtures is allowed for all closed halogen lamps, those in low pressure technology (Skylight) or ones with outer bulb.

Conventional halogen lamps with high pressure fillings reach operational pressures up to 25 bar, which means they are liable to explosion and must, therefore, be used in closed luminaires. Skylight lamps (in low pressure technology) reach max. 2.5 bar, only, and so they are allowed for open fixtures.



Burning position

Information regarding burning positions can be found on page 68.

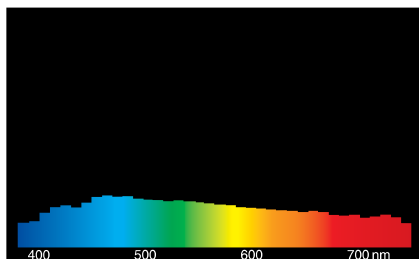


Dimming behaviour

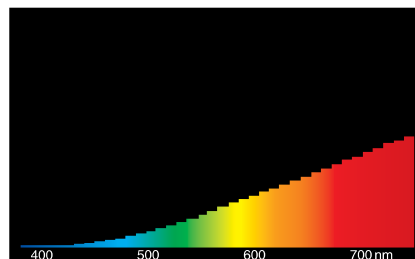
Halogen Lamps can be dimmed without restriction. If the lamp has blackened because of too long dimmed operation it can be burned clear again by operation at nominal voltage.



Spectral distribution of radiation



Daylight



Incandescent lamps



UV-EX

Halogen light does also contain UV radiation. This part of the emission will be reduced due to the filter properties of the lamp's special quartz glass.

The classic lights for works.

Low Pressure Discharge Lamps.



Fluorescent lamps - technically speaking, low-pressure discharge lamps - were until recently the easiest, best and cheapest way to illuminate offices, workshops and other commercial spaces efficiently. In the meantime, however, certain types of lamps are being replaced by LED lighting solutions in some areas of application, and EU directives will increasingly ensure this in the future. Nevertheless, some applications can hardly be imagined without them, since fluorescent lamps are so versatile and LED solutions do not yet exist for all special places.

Since fluorescent lamps contain mercury, they must be properly disposed of, i.e. given to collection points, which is shown by the symbol of the crossed-out waste bin.

Radium LED replacement lamps can be found at www.radium.de/led-lamps or in our LED Lamps catalogue, ideas for alternative solutions with LED strips at www.radium.de/led-strips in the LED Strips catalogue.





Compact Fluorescent Lamps.
(Page 24–29)
Fluorescent Lamps.
(Page 30–37)
Technical Information.
(Page 37–43)

Notes on Naming Lamps (Codes for Lamp Types)



Compact Fluorescent Lamps.

- 24 Ralux
- 25 Ralux
- 25 Ralux/E
- 26 Ralux Duo
- 27 Ralux Duo/E
- 27 Ralux Twin
- 28 Ralux Trio
- 28 Ralux Trio/E
- 29 Ralux Long
- 29 Ralux Long LT



1



Ralux

d (mm) l (mm) pcs.



	G23	B	10000h	≥ 80									
1	31315720	RX-S 7W/840/G23	7	400	57	4000	○	2.6	175	2.1	27	137	10
1	31319222	RX-S 7W/830/G23	7	400	57	3000	●	2.6	175	2.1	27	137	10

Compact lamps Ralux

Product features:

- Compact fluorescent lamps for professional applications
- Simple changing of lamp due to standardised base
- Cost-efficient maintenance



Ralux

d (mm) l (mm) pcs.



G23 A 10000h ≥ 80

1	31315722	RX-S 9W/840/G23	9	600	69	4000	○	2.8	170	2.0	27	167	10
1	31318908	RX-S 9W/830/G23	9	600	69	3000	●	2.8	170	2.0	27	167	10
1	31315801	RX-S 11W/840/G23	11	900	76	4000	○	2.7	155	1.7	27	237	10
1	31318909	RX-S 11W/830/G23	11	900	76	3000	●	2.7	155	1.7	27	237	10



Ralux/E

d (mm) l (mm) pcs.



2G7 A 20000h ≥ 80

2	31300027	RX-S/E 7W/840/2G7	7	400	57	4000	○	2.6	175	-	27	114	10
2	31300029	RX-S/E 9W/840/2G7	9	600	69	4000	○	2.8	170	-	27	144	10
2	31300031	RX-S/E 11W/840/2G7	11	900	76	4000	○	2.7	150	-	27	214	10

Further technical information from page 37.

Compact lamps Ralux Duo and Ralux Twin

Product features:

- Compact fluorescent lamps for professional applications
- Simple changing of lamp due to standardised base
- Cost-efficient maintenance



1



Ralux Duo

d (mm) l (mm) pcs.



G24d-1 B 10000h ≥ 80

1	31316918	RX-D 10W/840/G24D	10	600	60	4000	○	4.0	190	2.2	27	110	10
1	31318910	RX-D 10W/830/G24D	10	600	60	3000	●	4.0	190	2.2	27	110	10
1	31313613	RX-D 26W/865/G24D	26	1710	66	6500	●	5.5	325	3.2	27	172	10



G24d-1 A 10000h ≥ 80

1	31316919	RX-D 13W/840/G24D	13	900	69	4000	○	4.0	175	1.8	27	141	10
1	31318911	RX-D 13W/830/G24D	13	900	69	3000	●	4.0	175	1.8	27	141	10
1	31316920	RX-D 18W/840/G24D	18	1200	67	4000	○	4.5	220	2.2	27	154	10
1	31318912	RX-D 18W/830/G24D	18	1200	67	3000	●	4.5	220	2.2	27	154	10
1	31316921	RX-D 26W/840/G24D	26	1800	69	4000	○	5.5	325	3.2	27	172	10
1	31318803	RX-D 26W/830/G24D	26	1800	69	3000	●	5.5	325	3.2	27	172	10



Ralux Duo/E

d (mm) l (mm) pcs.



G24q-1 A 20000h ≥ 80

1	31311140	RX-D/E 10W/840/G24Q	10	600	60	4000	○	4.0	190	-	27	103	10
1	31311141	RX-D/E 13W/840/G24Q	13	900	69	4000	○	4.0	165	-	27	131	10
1	31312023	RX-D/E 13W/830/G24Q	13	900	69	3000	●	4.0	165	-	27	131	10
1	31311129	RX-D/E 18W/840/G24Q	18	1200	67	4000	○	4.5	210	-	27	146	10
1	31311486	RX-D/E 18W/830/G24Q	18	1200	67	3000	●	4.5	210	-	27	146	10
1	31311142	RX-D/E 26W/840/G24Q	26	1800	69	4000	○	5.5	300	-	27	165	10
1	31311487	RX-D/E 26W/830/G24Q	26	1800	69	3000	●	5.5	300	-	27	165	10



Ralux Twin

d (mm) l (mm) pcs.



2G10 A 10000h ≥ 80

2	31311240	RX-TW 24W/840/2G10	24	1700	71	4000	○	2.5	300	3.6	79	165	10
2	31311241	RX-TW 24W/830/2G10	24	1700	71	3000	●	2.5	300	3.6	79	165	10
2	31311045	RX-TW 36W/840/2G10	36	2800	78	4000	○	3.0	360	4.4	79	217	10
2	31311046	RX-TW 36W/830/2G10	36	2800	78	3000	●	3.0	360	4.4	79	217	10

Further technical information from page 37.

Compact lamps Ralux Trio

Product features:

- Compact fluorescent lamps for professional applications
- Simple changing of lamp due to standardised base
- Cost-efficient maintenance



Ralux Trio

d (mm) l (mm) pcs.



GX24d-2 B 10000h ≥ 80

			W	lm	lm/W	K	Temperature	cd/cm ²	mA	µF	d (mm)	l (mm)	pcs.
1	31311244	RX-T 18W/840/GX24D	18	1200	67	4000	○	4.7	225	2.3	49	124	10
1	31311247	RX-T 26W/840/GX24D	26	1800	68	4000	○	6.0	325	3.3	49	139	10



Ralux Trio/E

d (mm) l (mm) pcs.



GX24q-2 A 20000h ≥ 80

			W	lm	lm/W	K	Temperature	cd/cm ²	mA	µF	d (mm)	l (mm)	pcs.
2	31311250	RX-T/E 18W/840/GX24Q	18	1200	67	4000	○	4.7	210	-	49	116	10
2	31311251	RX-T/E 18W/830/GX24Q	18	1200	67	3000	●	4.7	210	-	49	116	10
2	31311253	RX-T/E 26W/840/GX24Q	26	1800	68	4000	○	6.0	300	-	49	131	10
2	31311254	RX-T/E 26W/830/GX24Q	26	1800	68	3000	●	6.0	300	-	49	131	10
2	31311490	RX-T/E 32W/840/GX24Q	32	2400	75	4000	○	6.5	320	-	49	147	10
2	31311491	RX-T/E 32W/830/GX24Q	32	2400	75	3000	●	6.5	320	-	49	147	10
2	31312025	RX-T/E 42W/840/GX24Q	42	3200	74	4000	○	7.0	320	-	49	168	10
2	31312026	RX-T/E 42W/830/GX24Q	42	3200	74	3000	●	7.0	320	-	49	168	10

Compact lamps Ralux Long

Product features:

- Compact fluorescent lamps for professional applications
- Simple changing of lamp due to standardised base
- Cost-efficient maintenance



Ralux Long

d (mm) l (mm) pcs.



2G11 A 20000h ≥ 80

1	31319383	RX-L 18W/830/2G11	18	1200	67	4000	○	2.1	320	38	217	10
1	31319384	RX-L 18W/840/2G11	18	1200	67	3000	●	2.1	320	38	217	10
1	31319385	RX-L 24W/830/2G11	24	1800	75	4000	○	2.1	300	38	317	10
1	31319386	RX-L 24W/840/2G11	24	1800	75	3000	●	2.1	300	38	317	10
1	31319387	RX-L 36W/830/2G11	36	2900	81	4000	○	2.8	360	38	411	10
1	31319388	RX-L 36W/840/2G11	36	2900	81	3000	●	2.8	360	38	411	10
1	31319389	RX-L 55W/830/2G11	55	4800	87	4000	○	3.2	550	38	535	10
1	31319390	RX-L 55W/840/2G11	55	4800	87	3000	●	3.2	550	38	535	10
1	31313852	RX-L 80W/830/2G11	80	6500	75	3000	●	3.7	555	38	565	10



Ralux Long LT

d (mm) l (mm) pcs.



2G11 A 20000h ≥ 80

2	31311235	RX-LT 18W/830/2G11*	18	1200	61	3000	●	2.1	320	38	209	10
2	31311236	RX-LT 24W/830/2G11*	24	1700	70	3000	●	2.1	300	38	309	10

* Discontinued product, only while stocks last.

Further technical information from page 37.

Fluorescent Lamps.

- 30 T5 Standard
- 31 T5 Spectralux
- 31 T8 Spectralux Plus 1m
- 32 T5 HE - Bonalux
- 33 T5 HO - Bonalux Super
- 34 T8 Spectralux Plus
- 35 T5 Bonalux Ring
- 35 T9 Spectralux Ring
- 36 Safety Starter
- 36 Starter



1



T5 Standard

d (mm) l (mm) pcs. from

	G5	B		10000h	≥ 60											
1	31118125	NL-T5 4W/640/G5			4	140	35	4000	○	0.85	170	2	16	136	25	-
	G5	A	KVG	10000h	≥ 60											
1	31118158	NL-T5 6W/640/G5			6	270	45	4300	○	0.95	160	2	16	212	25	-
1	31118160	NL-T5 8W/640/G5			8	385	48	4300	○	0.95	145	2	16	288	25	-
1	31118168	NL-T5 13W/640/G5			13	830	64	4300	○	0.95	165	2	16	517	25	-

Fluorescent lamps T5 and T8 special

Product features:

- Reliable technology
- Many fields of application
- Cost-efficient maintenance



1

2



T5 Spectralux

d (mm) l (mm) pcs. from



G5 A 10000h ≥ 80

1	31118162	NL-T5 8W/840/G5	8	430	54	4000	○	0.9	145	2	16	288	25	-
1	31111983	NL-T5 8W/827/G5	8	430	54	2700	●	0.9	145	2	16	288	25	-
1	31111984	NL-T5 13W/827/G5	13	950	73	2700	●	0.8	165	2	16	517	25	-



T8 Spectralux Plus 1m

d (mm) l (mm) pcs. from



G13 A 20000h ≥ 80

2	31114512	NL-T8 36W/840-1/G13	36	3100	86	4000	○	1.3	556	6	26	970	25	-
---	----------	----------------------------	----	------	----	------	---	-----	-----	---	----	-----	----	---

Further technical information from page 37.

Fluorescent lamps T5 HE

Product features:

- Reliable technology
- Many fields of application
- Cost-efficient maintenance



1



T5 HE - Bonalux

@ 25°C @ 35°C

d (mm) l (mm) pcs. from



G5 A+ 24000h ≥ 80

1	31118113	NL-T5 14W/865/G5	14	1100	1300	93	6500	●	1.7	165	16	549	20	-
1	31118214	NL-T5 14W/840/G5	14	1200	1350	93	4000	○	1.7	165	16	549	20	-
1	31118256	NL-T5 14W/830/G5	14	1200	1350	96	3000	●	1.7	165	16	549	20	-
1	31118500	NL-T5 21W/865/G5	21	1750	2000	95	6500	●	1.7	165	16	849	20	-
1	31118506	NL-T5 21W/840/G5	21	1900	2100	100	4000	○	1.7	165	16	849	20	-
1	31118560	NL-T5 21W/830/G5	21	1900	2100	100	3000	●	1.7	165	16	849	20	-
1	31114253	NL-T5 28W/865/G5	28	2400	2750	98	6500	●	1.7	170	16	1149	20	-
1	31114254	NL-T5 28W/840/G5	28	2600	2900	104	4000	○	1.7	170	16	1149	20	-
1	31114255	NL-T5 28W/830/G5	28	2600	2900	104	3000	●	1.7	170	16	1149	20	-
1	31114256	NL-T5 35W/865/G5	35	3050	3500	98	6500	●	1.7	175	16	1449	20	-
1	31114257	NL-T5 35W/840/G5	35	3320	3650	104	4000	○	1.7	175	16	1449	20	-
1	31114258	NL-T5 35W/830/G5	35	3320	3650	104	3000	●	1.7	175	16	1449	20	-

Fluorescent lamps T5 HO

Product features:

- Reliable technology
- Many fields of application
- Cost-efficient maintenance



1



T5 HO - Bonalux Super

@ 25°C @ 35°C

d (mm) l (mm) pcs. from



G5 A 24000h ≥ 80

1	31118703	NL-T5 24W/840/G5	24	1750	2000	89	4000	○	2.5	295	16	549	20	-
1	31119266	NL-T5 24W/830/G5	24	1750	2000	89	3000	●	2.5	295	16	549	20	-
1	31114266	NL-T5 54W/865/G5	54	4100	4750	88	6500	●	2.9	455	16	1149	20	-
1	31114269	NL-T5 80W/865/G5	80	5700	6650	83	6500	●	3.2	530	16	1449	20	-
1	31114270	NL-T5 80W/840/G5	80	6150	7000	88	4000	○	3.2	530	16	1449	20	-
1	31114271	NL-T5 80W/830/G5	80	6150	7000	88	3000	●	3.2	530	16	1449	20	-



G5 A+ 24000h ≥ 80

1	31119267	NL-T5 39W/840/G5	39	3100	3500	92	4000	○	2.8	325	16	849	20	-
1	31119269	NL-T5 39W/830/G5	39	3100	3500	92	3000	●	2.8	325	16	849	20	-
1	31114235	NL-T5 49W/840/G5	49	4310	4900	88	4000	○	2.3	255	16	1449	20	-
1	31114229	NL-T5 49W/830/G5	49	4300	4900	88	3000	●	2.3	255	16	1449	20	-
1	31114267	NL-T5 54W/840/G5	54	4450	5000	92	4000	○	2.9	455	16	1149	20	-
1	31114268	NL-T5 54W/830/G5	54	4450	5000	92	3000	●	2.9	455	16	1149	20	-

Further technical information from page 37.

Fluorescent lamps T8

Product features:

- Reliable technology
- Many fields of application
- Cost-efficient maintenance



1



T8 Spectralux Plus

d (mm) l (mm) pcs. from



G13 A 20000h* ≥ 80

1	31513102	NL-T8 15W/840/G13	15	950	63	4000	○	1.0	330	4.5	26	438	25	-
1	31119221	NL-T8 18W/865/G13	18	1300	72	6500	●	1.0	370	4.5	26	590	25	01.09.2023
1	31109313	NL-T8 18W/840/G13	18	1350	75	4000	○	1.0	370	4.5	26	590	25	01.09.2023
1	31109315	NL-T8 18W/830/G13	18	1350	75	3000	●	1.0	370	4.5	26	590	25	01.09.2023
1	31511165	NL-T8 30W/865/G13	30	2350	78	6500	●	1.2	365	4.5	26	895	25	-
1	31512919	NL-T8 30W/840/G13	30	2400	80	4000	○	1.2	365	4.5	26	895	25	-
1	31518151	NL-T8 30W/830/G13	30	2400	80	3000	●	1.2	365	4.5	26	895	25	-
1	31119104	NL-T8 36W/865/G13	36	3250	90	6500	●	1.2	430	4.5	26	1200	25	01.09.2023
1	31109316	NL-T8 36W/840/G13	36	3350	93	4000	○	1.2	430	4.5	26	1200	25	01.09.2023
1	31109319	NL-T8 36W/830/G13	36	3350	93	3000	●	1.2	430	4.5	26	1200	25	01.09.2023
1	31113514	NL-T8 38W/840/G13	38	3300	87	4000	○	1.3	430	4.5	26	1047	25	-
1	31510605	NL-T8 38W/830/G13	38	3300	87	3000	●	1.3	430	4.5	26	1047	25	-
1	31119103	NL-T8 58W/865/G13	58	5000	86	6500	●	1.5	670	7.0	26	1500	25	01.09.2023
1	31109322	NL-T8 58W/840/G13	58	5200	90	4000	○	1.5	670	7.0	26	1500	25	01.09.2023
1	31109401	NL-T8 58W/830/G13	58	5200	90	3000	●	1.5	670	7.0	26	1500	25	01.09.2023

* Lamp life determined in operation with ECG in 3h switching cycle (165 min. ON, 15 min. OFF) according to standard.

Fluorescent lamps in circular shape

Product features:

- Reliable technology
- Many fields of application
- Cost-efficient maintenance



T5 Bonalux Ring

@25°C

d (mm) l (mm) pcs. from



2GX13 A 12000h ≥ 80

1	31218618	NL-T5 22W/840C/2GX13	22	1900	85	4000	○	1.7	300	16	225	12	-
1	31218640	NL-T5 55W/840C/2GX13	55	4200	76	4000	○	2.6	550	16	300	12	-



2GX13 A+ 12000h ≥ 80

1	31218622	NL-T5 40W/840C/2GX13	40	3400	85	4000	○	2.1	320	16	300	12	-
---	----------	-----------------------------	----	------	----	------	---	-----	-----	----	-----	----	---



T9 Spectralux Ring

@25°C

d (mm) l (mm) pcs. from



G10q A 7500h* ≥ 80

2	31218361	NL-T9 22W/840C/G10Q	22	1230	61	4000	○	-	370	29	216	12	-
2	31218363	NL-T9 32W/840C/G10Q	32	2180	68	4000	○	-	430	29	305	12	-
2	31218365	NL-T9 40W/840C/G10Q	40	3200	80	4000	○	-	670	29	406	12	-

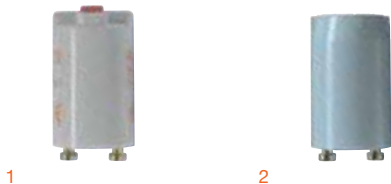
* Lamp life determined in conventional operation (with CCG) in 3h switching cycle (165 min. ON, 15 min. OFF) according to standard.

Further technical information from page 37.

Starters for Fluorescent Lamps

Product features:

- Replacement with every (simple starters) or every 4th lamp change (safety starters RS 71 and RS 72)
- Self-extinguishing Makrolon housing
- Starters for series connection, also for one lamp circuit 110 - 127V
- Contain interference-suppression capacitor
- Various test marks, e.g. VDE / ENEC 10 (see also p. 37)



Safety Starter

d (mm) l (mm) pcs.



-20 ... +80°C

1	52210849	RS 71	30-65	one lamp circuit	21.5	40.3	200
1	52210850	RS 72	18; 20; 22 / RX-L 18; 24	series connection	21.5	40.3	200



Starter

d (mm) l (mm) pcs.



-20 ... +80°C

2	52220102	RS 11	4-65; 80	one lamp circuit	21.5	40.3	400
2	52200711	RS 51	4-22 / RX-L 18; 24	series connection	21.5	40.3	400

What needs to be considered?

Technical information on lamp starts.

Starters and ballasts

When choosing ballast and starter attention must be paid to the mains voltage, the lamps' type and approved quality. This way only, a quick and flicker-free ignition and gentle operation of the lamps can be achieved. We recommend the safety quick starters RS 71 and 72 (see below). When using common starters we also recommend to replace the starter together with the worn lamp. Application of electronic control gear (ECG) for warm start ignites the lamp very gently and provides a calm, pleasant light by high frequency operation. Mean service life of the lamps increases.

Starters for Fluorescent Lamps

The starters RS 71 and RS 72 have four times the service life of conventional starters.

Starters named above must be changed with every 4th new lamp.

Starters RS 11 and RS 51 have to be changed with every lamp replacement in order to ensure a reliable ignition. Temperature for safe switching off: -20°C – $+80^{\circ}\text{C}$. Radium starters have a self-extinguishing housing of insulating macrolon material. They meet the requirements of Protection Class II.

The starters are fitted with a special interference-suppression capacitor (foil-winding capacitor). All starters are VDE-tested. They bear the marks of conformity with DEMKO, SEMKO, NEMKO, CEBEC, KEMA, CSA, IMQ and ENEC 10.





















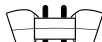



Safety starters RS 71 and RS 72

Starters RS 71 and 72 ensure an especially quick and gentle ignition of the lamps. When overloaded by burned out or defective lamps they switch off instantly and reliably (temperature range from -20° to $+80^{\circ}\text{C}$). So no further attempts to ignite the lamps will be made, which could otherwise lead to flickering and high energy consumption because of a short-circuited ballast. By pressing the red button – e.g. when changing lamps – they are ready for operation again. In comparison to common starters they have got four times the service life and they can also be used with conventional control gear (CCG/LLCG).

Overview of Important Information.

Technical Information.

Lamp Bases (DIN-EN 60061-1)

 	 	 	 
G23 Sheet 7004-69-1	2G7 Sheet 7004-102-1	G24d Sheet 7004-78-5	G24q Sheet 7004-78-5
 	 	 	 
GX24d Sheet 7004-78-5	GX24q Sheet 7004-78-5	2G11 Sheet 7004-82-1	2G10 Sheet 7004-118-1
 	 	 	 
G5 Sheet 7004-52-7	G13 Sheet 7004-51-9	2GX13 Sheet 7004-125-4	G10q Sheet 7004-54-4



Compact fluorescent lamps

Compact fluorescent lamps differ from tubular ones by a smaller diameter of the glass tube and by the “folding” of the length which is needed for light generation and being held in one base. Starter and interference suppression capacitor are built in this base (2-pin) for some types of lamps (Ralux, - Duo, -Trio). These lamps cannot be dimmed. The lamps with 4-pin-base depend on external ignition by starter or ECG (Ralux .../E, Long, Long LT, Twin), on the other hand they can be dimmed if operated with suitable accessories and they can also be used for safety illumination. Switching robustness is determined at a switching rhythm of 60s on, 180s off and can be found in the tables of technical data for the Compact Fluorescent Lamps wanted. Compact fluorescent lamps with integral ECG (Energy saving lamps) are not suitable for emergency operation. In outdoor applications energy saving lamps are to be used in closed, well aired luminaires only.

Operation of Fluorescent Lamps



Ralux 7, 9 W *	yes	yes	no	no
Ralux 11 W *	yes	no	no	no
Ralux S/E 7, 9, 11 W	no	no	yes	yes
Ralux Duo 10, 13, 18, 26 W *	yes	no	no	no
Ralux Duo/E 10, 13, 18, 26 W	no	no	yes	yes
Ralux Trio 18, 26 W *	yes	no	no	no
Ralux Trio/E 18, 26, 32, 42 W	no	no	yes	yes
Ralux Long 18, 24 W	ja + RS 11	no	yes	yes
Ralux Long 36 W	ja + RS 11/71	no	yes	yes
Ralux Long 55, 80 W	no	no	yes	yes
Ralux Long LT 18, 24 W	yes + RS 11	no	yes	yes
Ralux Twin 24 W	yes + RS 11	no	yes	yes
Ralux Twin 36 W	yes + RS 11/71	no	yes	yes
Bonalux 14, 21, 28, 35 W	no	no	yes	yes
Bonalux Super 24, 39, 49, 54, 80 W	no	no	yes	yes
Bonalux Ring 22, 40, 55 W	no	no	yes	yes
NL 4, 6, 8, 13 W	yes + RS 11	yes + RS 51	yes	yes
NL 15 W	yes + RS 11	yes + RS 51	yes	yes
NL 18 W	yes + RS 11	yes + RS 51/72	yes	yes
NL 30, 36, 38, 58 W	yes + RS 11/71	no	yes	yes
NL Ring 22 W	yes + RS 11	yes + RS 51/72	yes	yes
NL Ring 32, 40 W	yes + RS 11/71	no	yes	yes

* Lamp with integrated starter

Explanation of abbreviations/legend

- ECG: electronic ballast
- CCG: conventional choke coil or low-loss ballast (LLCG)
- RS 11: simple starter for one lamp circuit
- RS 51: simple starter for series connection
- RS 71: safety starter for one lamp 30-65 W
- RS 72: safety starter for series connection



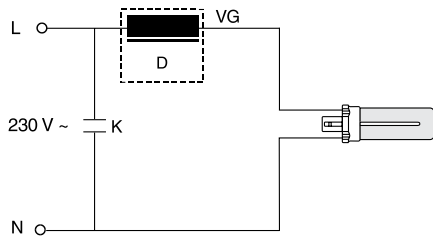
Notes on Burning Position

Fluorescent lamps with diameter 26mm (T8) can be operated in any burning position.

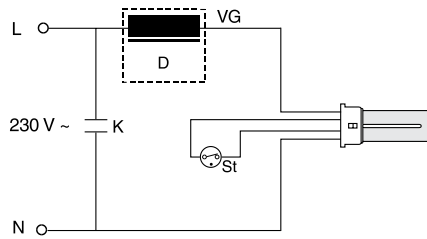
For 16mm (T5) Bonalux® and Bonalux® Super, please, observe:

- Vertical burning position – marking down
- Two or more lamp-luminaire – markings all to one side, min. distance 32mm
- T5 circular lamp, vertical burning position – base down

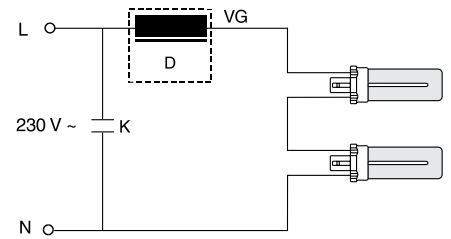
Circuit Examples for Compact Fluorescent Lamps



One lamp circuit with ECG for Ralux/E (Starter integrated)



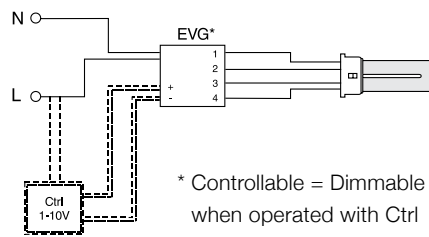
One lamp circuit with ECG for Ralux/E (Starter RS 11, 71)



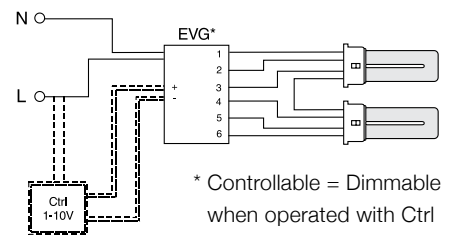
Series connection with ECG for Ralux/E (Starter integrated)

Explanation of abbreviations/legend

- D = choke
- L • = lamp
- St = starter
- VG = ballast
- electromagnetic (CCG/LLCG)
- electronic (ECG)
- L = phase
- N = zero potential
- Tr = transformer
- K = p. f. correction capacitor
- KE = radio interference suppressing capacitor
- Z = ignition aid
- Ctrl = Controller, dimmer

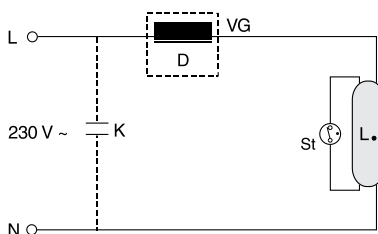


One lamp circuit with ECG for Ralux/E

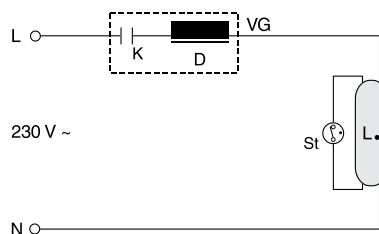


Series connection with ECG for Ralux/E

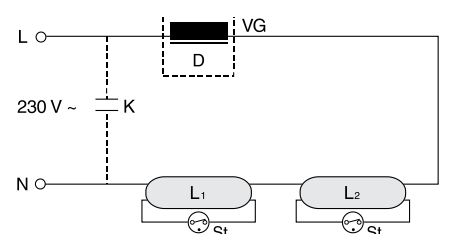
Circuit Examples for Fluorescent Lamps



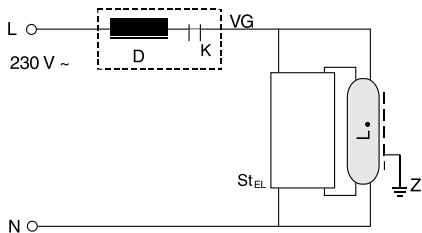
Inductive one lamp circuit with CCG/LLCG (starters RS11, RS71)



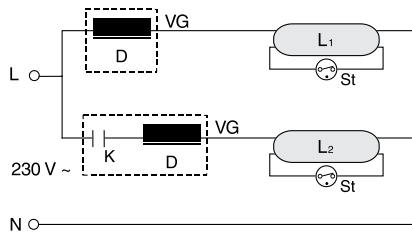
Capacitive one lamp circuit with CCG/LLCG (starters RS11, RS71)



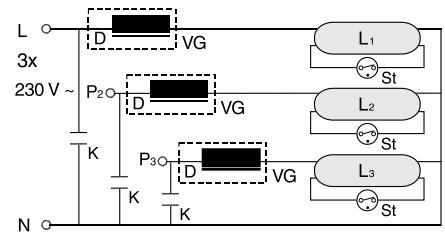
Series connection (Starters RS 51, 72)



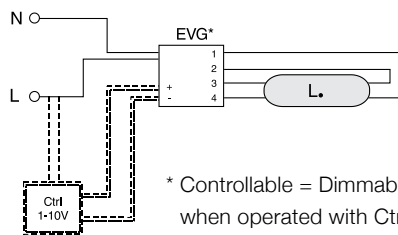
One lamp circuit with CCG/LLCG (electronic starter)



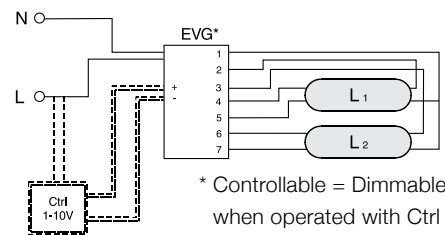
Lead-lag circuit (inductive and capacitive; starters RS 11, 71)



Three-phase circuit (starters RS 11, 71)



One lamp circuit with ECG (for T5: special ECG!)



Series connection with ECG (for T5: special ECG!)



Mains voltage

Ignition and operation of Radium NL-lamps with normal control gear is guaranteed at the European standard voltage $230V \pm 10\%$. Operation of fluorescent lamps depends on ballasts and starters or circuit respectively. Therefore, these must be designed for eventually different conditions such as direct current or other voltages.



Power factor

The power factor $\cos \varphi$ expresses the effective power of a circuit, i.e. target is $\cos \varphi \approx 1$. With the choke coil(s) in the ballast the result is $\cos \varphi \approx 0,5$ (inductive). You can achieve ≈ 1 by compensation with capacitors, group compensation is possible. The two branches of the lead-lag circuit even out to $\cos \varphi \approx 1$. In order to get the power factor $\cos \varphi \approx 1$ there must be compensation in a lamp operation circuit with CCG. Usually, this compensation is a parallel compensation (see circuit figures), the value of the needed capacitor is to be taken from the technical data of the respective lamp. In capacitive circuits as well as in the capacitive leg of a lead-lag-circuit, voltage robust (450V) and closely tolerated capacitors ($\pm 2\%$) and ballasts ($\pm 1,5\%$) must be used. Circuits with ECG normally reach $\cos \varphi \approx 1$.



Dimming Behaviour

Compact fluorescent lamps and fluorescent lamps can be dimmed by suitable electronic ballasts only. Commercially available energy-saving lamps (compact fluorescent lamps with integral ballast and standard base) are not dimmable.

CRI

Colour rendering and colour temperature

K

COLOUR

CRI

K

COLOUR OLD



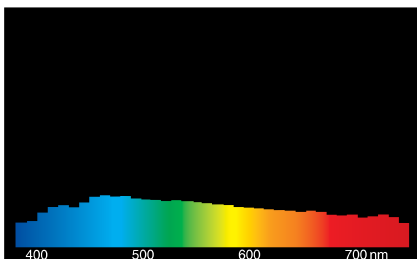
880	80-89	8000	–	● Skylux
865	80-89	6500	11	● cool daylight
840	80-89	4000	21	○ white
640	60-69	4000	20	○ coolwhite
830	80-89	3000	31	● warmwhite
827	80-89	2700	41	● intra



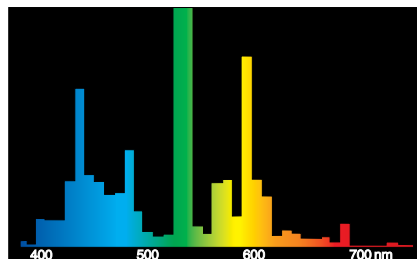
Spectral distribution of radiation

Fluorescent Lamps and Compact Fluorescent Lamps

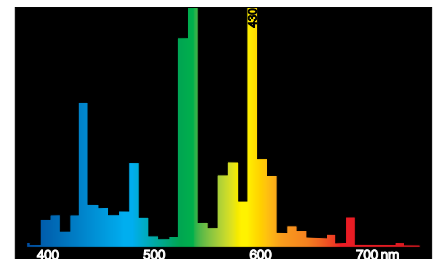
As the daylight is a mixture of direct sun light and sky light, its spectral composition changes continuously depending on the time of day and weather. The normal D65 type of light corresponds to a type of day light with a colour temperature of approx. 6 500 K.



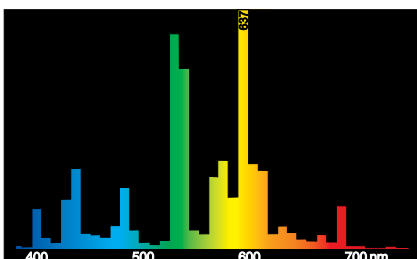
Daylight (D 65)



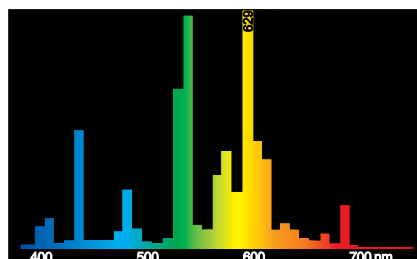
Light colour 865 Spectralux® daylight



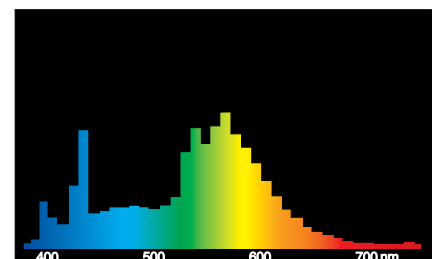
Light colour 840 Spectralux® white



Light colour 830 Spectralux® warm white



Light colour 827 Spectralux® Intra



Light colour 640 bright white

Operation of Lamps



Burning in

In general, discharge lamps like fluorescent lamps need about 100 hrs burning in time under full power. During this period the lamps should not be moved (taken out and put back into the fixture), not be dimmed, switched as little as possible and they should not be subject to draught. T5/16mm-lamps might not even reach their lumen specifications without appropriate burning in phase.



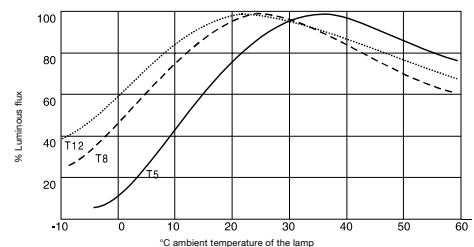
Reliance on temperature

Luminous flux for all fluorescent lamps depends on the ambient temperature very much (see example or on request), for T5-lamps and compact fluorescent lamps also influenced by the burning position.

The maximum of the luminous flux for most lamps is at an ambient temperature of about 25°C. Therefore, all luminous flux data are measured at 25°C and quoted, exceptions are indicated.

If the less luminous flux in the cold (refrigerated storage, outdoor lighting) cannot be accepted, we recommend using tight or insulated luminaires. Alternatively, retrofitting with LED tubes might be considered.

The temperatures quoted for ignition of fluorescent lamps are to be understood as benchmarks which depend on the operation (ECG, CCG) as well as on other ambient conditions.



Service Life of fluorescent lamps



Spectralux®



Bonalux®



Bonalux Super®



Bonalux Ring®

		Spectralux®	Bonalux®	Bonalux Super®	Bonalux Ring®
CCG/LLCG	Economic life (h)	12000	-	-	-
CCG/LLCG	Mean service life (h)	15000	-	-	-
ECG	Economic life (h)	18000	18000	18000	9000
ECG	Mean service life (h)	20000	24000	24000	16000



The Bright Ones.

High Pressure Discharge Lamps.

In terms of lighting technology, “a lot of light from a small burner” is the most outstanding property of high-pressure discharge lamps. Thanks to the reflector in the luminaire, the light can be easily directed to where it is needed. Overall, the systems are proven and robust technology. They are therefore still widely used today in large-area, sports facility and industrial hall lighting, as well as and not least in street lighting.

The operation of this type of lamp is demanding: the selection of the suitable control gear and the correct installation require a certain amount of specialist knowledge and must, therefore, be carried out by a specialist. High pressure discharge lamps also contain mercury and must be disposed of properly.

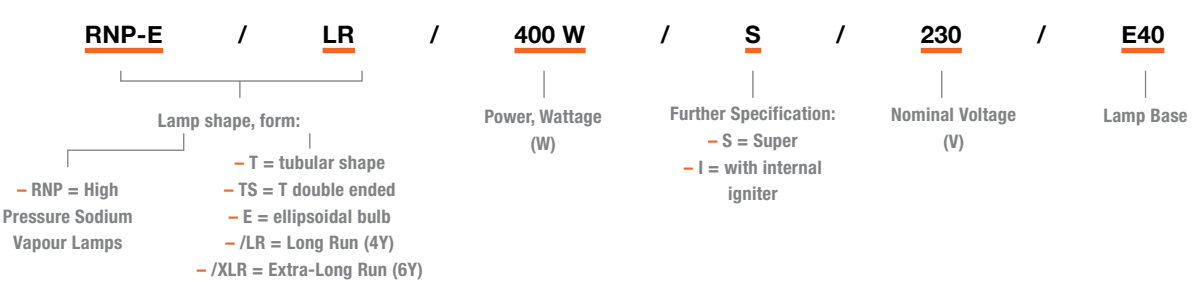
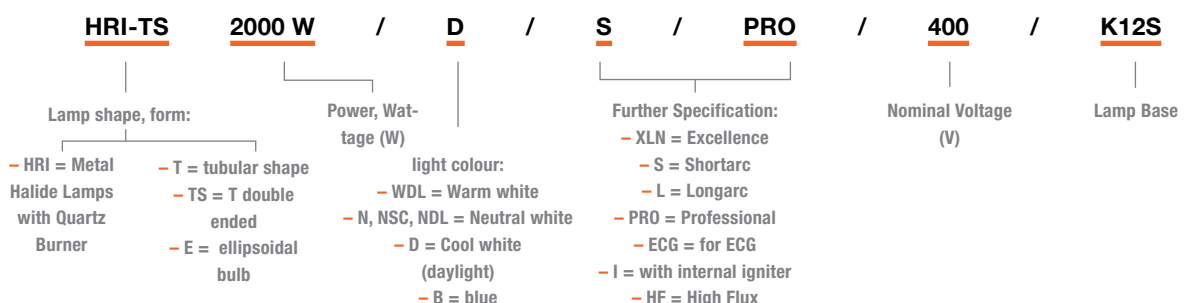
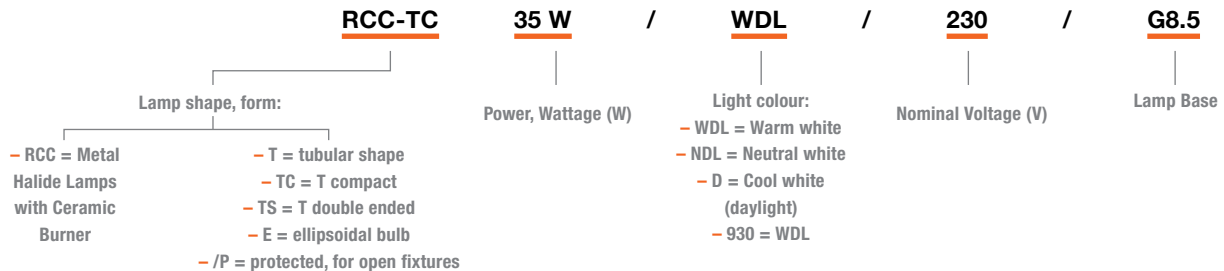
A conversion to LED lighting systems (complete refurbishment) is now possible in many applications, but must be economically, electrically and photometrically tested and professionally accompanied. Our experts from the Radium Sports & Area team will be happy to support you with any questions you may have on this complex of topics.





Metal Halide Lamps with Ceramic Burner (Page 46–49)
Metal Halide Lamps with Quartz Burner (Page 50–61)
High Pressure Sodium Vapour Lamps (Page 62–67)
Technical Information (Page 68–75)

Notes on Naming Lamps (Codes for Lamp Types)



Metal Halide Lamps with Ceramic Burner.

- 46 RCC-E/P
- 47 RCC-TS
- 48 RCC-TC
- 49 RCC-T



1



RCC-E/P

d (mm) l (mm) pcs.



E27 A+ 12000h 220-240

1	32418260	RCC-E/P 150W/WDL/230/F/E27*	145	13700	102	3000	●	88	54	138	12
---	----------	-----------------------------	-----	-------	-----	------	---	----	----	-----	----

Operation in open fixtures as well.

* Discontinued product, only while stocks last. Successor still to be determined.



Technical Specifications for Operation

32418260	RCC-E/P 150W/WDL/230/F/E27	CCG + ECG	164	1.8	1.8	20	3.6 to 5.0	-	h180
----------	----------------------------	-----------	-----	-----	-----	----	------------	---	------

Ceraball Ceramic Burner Lamps

Product features:

- Reliable technology
- Many fields of application
- Very good colour stability during service life
- Excellent light distribution



1



RCC-TS

d (mm) l (mm) mm pcs.



RX7S A+ 16000h 220-240

1	32418271	RCC-TS 70W/NDL/230/RX7S*	73	6700	86	4200	○	94	20	-	114.2	12
1	32418270	RCC-TS 70W/WDL/230/RX7S*	73	7000	96	3000	●	88	20	-	114.2	12
1	32418273	RCC-TS 150W/NDL/230/RX7S*	138	14800	100	4200	○	96	23	-	132.0	12
1	32419272	RCC-TS 150W/930/230/RX7S*	147	15000	101	3000	●	≥ 90	23	-	132.0	12

Operation in enclosed luminaires

* Discontinued product, only while stocks last. Successor still to be determined.



Technical Specifications for Operation

32418271	RCC-TS 70W/NDL/230/RX7S	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	36	p45
32418270	RCC-TS 70W/WDL/230/RX7S	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	36	p45
32418273	RCC-TS 150W/NDL/230/RX7S	CCG + ECG	155	1.8	1.8	20	3.6 to 5.0	36	p45
32419272	RCC-TS 150W/930/230/RX7S	CCG + ECG	164	1.8	1.8	20	3.6 to 5.0	36	p45

Further technical information from page 68.

Ceraball Ceramic Burner Lamps

Product features:

- Reliable technology
- Many fields of application
- Very good colour stability during service life
- Excellent light distribution



1



RCC-TC

d (mm) l (mm) pcs.



G8.5 A 15000h 220-240

1	32418945	RCC-TC 20W/WDL/230/G8.5*	22	1700	85	3000	●	83	15	81	12
1	32418937	RCC-TC 35W/NDL/230/G8.5*	39	3500	90	4200	○	90	15	81	12
1	32418936	RCC-TC 35W/WDL/230/G8.5*	39	3700	95	3000	●	85	15	81	12
1	32418939	RCC-TC 70W/NDL/230/G8.5*	73	6800	93	4200	○	96	15	81	12
1	32418938	RCC-TC 70W/WDL/230/G8.5*	73	7200	99	3000	●	89	15	81	12

Operation in enclosed luminaires

* Discontinued product, only while stocks last. Successor still to be determined.



Technical Specifications for Operation

32418945	RCC-TC 20W/WDL/230/G8.5	ECG	-	0.2	-	-	-	h180
32418937	RCC-TC 35W/NDL/230/G8.5	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32418936	RCC-TC 35W/WDL/230/G8.5	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32418939	RCC-TC 70W/NDL/230/G8.5	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180
32418938	RCC-TC 70W/WDL/230/G8.5	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180



1



RCC-T

d (mm) l (mm) pcs.



G12 A+ 15000h 220-240

1	32418264	RCC-T 35W/WDL/230/G12*	39	3700	95	3000	●	85	19	100	12
1	32418266	RCC-T 70W/WDL/230/G12*	73	7400	101	3000	●	89	19	100	12
1	32418269	RCC-T 150W/NDL/230/G12*	147	14700	100	4200	○	95	25	105	12
1	32419268	RCC-T 150W/930/230/G12*	147	17500	109	3000	●	91	19	105	12

Operation in enclosed luminaires

* Discontinued product, only while stocks last. Successor still to be determined.



Technical Specifications for Operation

32418264	RCC-T 35W/WDL/230/G12	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32418266	RCC-T 70W/WDL/230/G12	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180
32418269	RCC-T 150W/NDL/230/G12	CCG + ECG	166	1.8	1.8	20	3.6 to 5.0	h180
32419268	RCC-T 150W/930/230/G12	CCG + ECG	166	1.8	1.8	20	4.0 to 5.0	h180

Further technical information from page 68.

Metal Halide Lamps with Quartz Burner.

- 50 HRI-TS E40
- 51 HRI-TS RX7s
- 52 HRI-TS Fc2
- 53 HRI-T G12
- 54 HRI-T E40
- 55 HRI-T Aquastar blue
- 56 HRI-E E40
- 57 HRI-E E40 NSC
- 58 HRI-TS K12s ECG Shortarc
- 59 HRI-TS K12s Shortarc
- 60 HRI-TS K12s Shortarc
- 60 HRI-TS K12s DP Shortarc
- 61 HRI-TS K12s Longarc



1



HRI-TS E40

d (mm) l (mm) pcs.



1	32416569	HRI-TS 2000W/D/400/E40	A+	2000	180000	90	6000	●	93	100	495	4
---	----------	-------------------------------	----	------	--------	----	------	-------------------------------------	----	-----	-----	---



Technical Specifications for Operation

32416569	HRI-TS 2000W/D/400/E40	CCG	2100	10.2	10.3	60	4.0 to 5.0	60	p30
----------	-------------------------------	-----	------	------	------	----	------------	----	-----

Double ended Metal Halide Lamps with Quartz Burner

Product features:

- Reliable technology
- Many fields of application
- Excellent light distribution
- Operation in enclosed luminaires



1



HRI-TS RX7s

d (mm) l (mm)

pcs.



RX7s-24 12000h 220-240

1	32418878	HRI-TS 70W/NDL/230/XLN/RX7S	A	78	6500	83	4200	○	78	20	117	114.2	12
1	32418879	HRI-TS 70W/WDL/230/XLN/RX7S	A	78	6000	77	3000	●	67	20	117	114.2	12
1	32418880	HRI-TS 150W/D/230/XLN/RX7S	A	150	13000	87	5600	●	81	23	135	132.0	12
1	32418876	HRI-TS 150W/NDL/230/XLN/RX7S	A	150	12500	83	4200	○	80	23	135	132.0	12
1	32418881	HRI-TS 150W/WDL/230/XLN/RX7S	A	150	12000	80	3000	●	70	23	135	132.0	12



Technical Specifications for Operation

32418878	HRI-TS 70W/NDL/230/XLN/RX7S	CCG + ECG	90	1.0	1.0	12	4.0 to 5.0	35	p45
32418879	HRI-TS 70W/WDL/230/XLN/RX7S	CCG + ECG	90	1.0	1.0	12	4.0 to 5.0	35	p45
32418880	HRI-TS 150W/D/230/XLN/RX7S	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	35	p45
32418876	HRI-TS 150W/NDL/230/XLN/RX7S	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	35	p45
32418881	HRI-TS 150W/WDL/230/XLN/RX7S	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	35	p45

Further technical information from page 68.



1



HRI-TS Fc2

d (mm) l (mm) pcs.



Fc2 12000h 220-240

1	32418888	HRI-TS 250W/D/PRO/230/FC2	A	250	21500	86	5500	●	93	26	162	12
1	32418889	HRI-TS 250W/NDL/230/FC2	A	250	20000	80	4200	○	88	26	162	12
1	32418890	HRI-TS 250W/WDL/230/FC2	A	250	22000	88	3200	●	80	26	162	12
1	32418891	HRI-TS 400W/D/PRO/230/FC2	A	400	35000	83	5500	●	93	33	206	12
1	32418892	HRI-TS 400W/NDL/230/FC2	A+	400	36000	88	4200	○	85	33	206	12



Technical Specifications for Operation

32418888	HRI-TS 250W/D/PRO/230/FC2	CCG	280	3.0	3.0	32	4.0 to 5.0	35	p45
32418889	HRI-TS 250W/NDL/230/FC2	CCG	280	3.0	3.0	32	4.0 to 5.0	35	p45
32418890	HRI-TS 250W/WDL/230/FC2	CCG	280	2.8	3.0	32	4.0 to 5.0	35	p45
32418891	HRI-TS 400W/D/PRO/230/FC2	CCG	440	4.1	4.6	45	4.0 to 5.0	35	p45
32418892	HRI-TS 400W/NDL/230/FC2	CCG	430	4.1	4.6	45	4.0 to 5.0	35	p45

Tubular Metal Halide Lamps with one Base

Product features:

- Reliable technology
- Many fields of application
- Excellent light distribution
- Operation in enclosed luminaires



1



HRI-T G12

d (mm) l (mm) pcs.



G12

9000h

230

1	32418898	HRI-T 70W/NDL/230/G12	A	75	5800	79	4200	○	80	25	84	12
1	32418899	HRI-T 70W/WDL/230/G12	A	75	5300	71	3000	●	73	25	84	12
1	32418900	HRI-T 150W/NDL/230/G12	A+	150	13000	87	4200	○	85	25	84	12
1	32418901	HRI-T 150W/WDL/230/G12	A+	150	13000	87	3000	●	77	25	84	12



Technical Specifications for Operation

32418898	HRI-T 70W/NDL/230/G12	CCG	96	1.0	1.0	12	4.0 to 5.0	h180
32418899	HRI-T 70W/WDL/230/G12	CCG	96	1.0	1.0	12	4.0 to 5.0	h180
32418900	HRI-T 150W/NDL/230/G12	CCG	170	1.8	1.8	20	4.0 to 5.0	h180
32418901	HRI-T 150W/WDL/230/G12	CCG	170	1.8	1.8	20	4.0 to 5.0	h180

Further technical information from page 68.

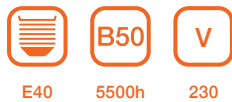


HRI-T E40

d (mm) l (mm) pcs.



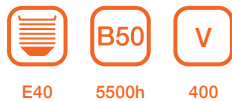
	E40	12000h	230										
MIG.	1	32418882	HRI-T 250W/D/PRO/230/E40	A	250	19000	76	5500	●	92	46	226	12
	2	32418883	HRI-BT 400W/D/PRO/230/E40	A	420	34000	80	5500	●	92	62	285	12
MIG.	3	32416565	HRI-T 1000W/D/230/E40	A	1000	85000	85	7250	●	81	76	345	6



	E40	5500h	230										
MIG.	1	32416606	HRI-T 400/NSC/S/230/E40	A+	430	40000	89	3700	○	62	46	273	12
MIG.	3	32416659	HRI-T 1000W/NSC/230/E40	A+	1000	110000	105	3500	○	64	82	345	6



	E40	12000h	400										
MIG.	4	32416653	HRI-T 2000W/D/400/E40	A	2050	180000	86	7250	●	80	106	430	4
MIG.	5	32416652	HRI-T 2000W/D/I/400/E40	A	2050	180000	85	7250	●	83	106	430	4
MIG.	5	32416650	HRI-T 2000W/N/I/400/E40	A+	2000	205000	102	4300	○	60	106	430	4



	E40	5500h	400										
MIG.	4	32416651	HRI-T 2000W/NSC/400/E40	A+	2000	245000	124	4500	○	63	106	430	4



Technical Specifications for Operation

32418882	HRI-T 250W/D/PRO/230/E40	CCG	280	3.0	3.0	32	4.0 to 5.0	h180
32418883	HRI-BT 400W/D/PRO/230/E40	CCG	450	4.0	4.6	45	4.0 to 5.0	h180
32416565	HRI-T 1000W/D/230/E40	CCG	1070	8.9	9.5	85	4.0 to 5.0	p30
32416606	HRI-T 400/NSC/S/230/E40	CCG	478	4.0	4.6	45	4.0 to 5.0	p45
32416659	HRI-T 1000W/NSC/230/E40	CCG	1070	9.1	9.5	85	4.0 to 5.0	p30
32416653	HRI-T 2000W/D/400/E40	CCG	2150	10.2	10.3	60	4.0 to 5.0	p30
32416652	HRI-T 2000W/D/I/400/E40	CCG	2100	10.3	10.3	60	-	p30
32416650	HRI-T 2000W/N/I/400/E40	CCG	2150	8.6	8.8	37	-	p30
32416651	HRI-T 2000W/NSC/400/E40	CCG	2100	9.4	8.8	37	4.0 to 5.0	p60

The underwater lighting.

HRI Aquastar.



Metal Halide Lamps Blue

Product features:

- Reliable technology
- Special for aquarium lighting
- Very good colour stability during service life
- Operation in enclosed luminaires



1



HRI-T Aquastar blue

d (mm) l (mm) h pcs.



E40 230

1	32416552	HRI-T 250W/230/B/E40	B	270	7500	20000	●	-	46	210	4000	12
1	32416555	HRI-T 400W/230/B/E40	C	360	8700	20000	●	-	46	273	7500	12



Technical Specifications for Operation

32416552	HRI-T 250W/230/B/E40	CCG	300	3.0	3.0	32	4.0 to 5.0	p55
32416555	HRI-T 400W/230/B/E40	CCG	385	3.6	3.5	35	4.0 to 5.0	p55

Further technical information from page 68.

Metal Halide Lamps with Elliptical Bulb

Product features:

- Reliable technology
- Many fields of application
- Excellent light distribution
- Operation in enclosed luminaires



1



HRI-E E40

d (mm) l (mm) pcs.



E40



16000h



230

1	32418885	HRI-E 250W/D/PRO/230/E40	A	250	18000	73	5200	●	92	90	226	12
1	32418884	HRI-E 400W/D/PRO/230/E40	A	420	34000	81	5200	●	92	120	290	12



Technical Specifications for Operation

32418885	HRI-E 250W/D/PRO/230/E40	CCG	280	3.0	3.0	32	4.0 to 5.0	h180
32418884	HRI-E 400W/D/PRO/230/E40	CCG	450	4.0	4.6	45	4.0 to 5.0	h180



1



2

**HRI-E E40 NSC**

d (mm) l (mm) pcs.



E40



12000h



230

1	32416605	HRI-E 400/NSC/S/230/C/E40	A+	440	42000	95	4000	○	62	120	290	12
1	32416601	HRI-E 1000W/NSC/230/C/E40	A+	1000	110000	110	3900	○	65	165	380	6



E40



9000h



230

2	32416604	HRI-E 400/NSC/S/230/F/E40	A+	440	40000	91	3800	○	62	120	290	12
2	32416584	HRI-E 1000W/NSC/230/F/E40	A+	1050	100000	94	3700	○	62	165	380	6

**Technical Specifications for Operation**

32416605	HRI-E 400/NSC/S/230/C/E40	CCG	470	4.0	4.6	45	4.0 to 5.0	h45
32416601	HRI-E 1000W/NSC/230/C/E40	CCG	1070	9.5	9.5	85	4.0 to 5.0	h45
32416604	HRI-E 400/NSC/S/230/F/E40	CCG	470	4.0	4.6	45	4.0 to 5.0	h45
32416584	HRI-E 1000W/NSC/230/F/E40	CCG	1120	9.5	9.5	85	4.0 to 5.0	h45

Further technical information from page 68.



1



**MADE
INGER
MANY.**



HRI-TS K12s ECG Shortarc

d (mm) l (mm) pcs.



K12s-36 A+ 6000h 230

1	32416647	HRI-TS 1000W/D/S/ECG/K12S	1200	117000	98	6000		88	41	187	10
---	----------	----------------------------------	------	--------	----	------	--	----	----	-----	----



Technical Specifications for Operation

32416647	HRI-TS 1000W/D/S/ECG/K12S	ECG	1330	-	-	-	-	-	-	p15/s15
----------	----------------------------------	-----	------	---	---	---	---	---	---	---------

Metal Halide Lamps for Professional Sports Venue Lighting

Product features:

- Reliable technology
- Suitable for film and TV production
- Excellent beam control possible
- Operation in enclosed luminaires



1



HRI-TS K12s Shortarc

h d (mm) l (mm) pcs.



K12s-36 A+ 230

		W	lm	lm/W	K	°C	CRI	B50	h	d (mm)	l (mm)	pcs.
1	32416576	HRI-TS 1000W/D/S/PRO/230/K12S	1000	90000	90	6100	●	85	8000	36	187	10
1	32416593	HRI-TS 1000W/NDL/S/230/K12S	1000	90000	90	4400	○	85	6000	36	187	10



Technical Specifications for Operation

		CCG	1070	9.3	9.5	85	4.0 to 5.0	36	p15/s15
32416576	HRI-TS 1000W/D/S/PRO/230/K12S	CCG	1070	9.3	9.5	85	4.0 to 5.0	36	p15/s15
32416593	HRI-TS 1000W/NDL/S/230/K12S	CCG	1070	9.7	9.5	85	4.0 to 5.0	36	p15

Further technical information from page 68.



1



2



3



HRI-TS K12s Shortarc

h d (mm) l (mm) pcs.



K12s-36 A+ 400

1	32416491	HRI-TS 2000W/D/S/HF/400/K12S	2060	230000	112	6200	●	83	4500	36	187	10
2	32418615	HRI-TS 2000W/D/S/400/K12S	1950	210000	108	6100	●	83	4500	36	187	10
2	32416580	HRI-TS 2000W/NDL/S/400/K12S	2000	222000	115	4400	○	90	6000	36	187	10



HRI-TS K12s DP Shortarc

h d (mm) l (mm) pcs.



A+ 400

3	32416625	HRI-TS 2000W/D/S/DP/400*	2020	220000	109	6100	●	83	5000	36	365	10
---	----------	---------------------------------	------	--------	-----	------	---	----	------	----	-----	----

* 1:1-Replacement for MHN-SA 2000W



Technical Specifications for Operation

32416491	HRI-TS 2000W/D/S/HF/400/K12S	CCG	2160	12.2	12.2	70	4.0 to 5.0	36	p15
32418615	HRI-TS 2000W/D/S/400/K12S	CCG	2050	11.3	10.3	60	4.0 to 5.0	36	p15
32416580	HRI-TS 2000W/NDL/S/400/K12S	CCG	2030	11.5	10.3	60	4.0 to 5.0	36	p15
32416625	HRI-TS 2000W/D/S/DP/400	CCG	2120	11.6	11.3	70	4.0 to 5.0	36	p15



1



**MADE
INGER
MANY.**



HRI-TS K12s Longarc

h d (mm) l (mm) pcs.



K12s-36 A+ 400

1	32416582	HRI-TS 2000W/N/L/400/K12S	2150	230000	107	4100	○	65	8000	32	274	10
---	----------	----------------------------------	------	--------	-----	------	---	----	------	----	-----	----



Technical Specifications for Operation

32416582	HRI-TS 2000W/N/L/400/K12S	CCG	2250	10.4	10.3	60	4.0 to 5.0	-	p15
----------	----------------------------------	-----	------	------	------	----	------------	---	-----

Further technical information from page 68.

High Pressure Sodium Vapour Lamps.

- 62 RNP-TS Super
- 63 RNP-T/XLR Super
- 64 RNP-T/LR Super
- 64 RNP-T Standard
- 65 RNP-E/XLR Super
- 66 RNP-E/LR Super
- 67 RNP-E .../I



1



RNP-TS Super



RX7S 2000 25 230

			A+	70	6600	94	28000	16000	20	120	114.2	12
1	34411782	RNP-TS/LR 70W/S/230/RX7S	A+	70	6600	94	28000	16000	20	120	114.2	12
1	34411080	RNP-TS/LR 150W/S/230/RX7S	A+	150	15000	100	28000	16000	23	138	132.0	12



Technical Specifications for Operation

34411782	RNP-TS/LR 70W/S/230/RX7S	CCG + ECG	82	1.0	1.0	12	4.0 to 5.0	25	p45
34411080	RNP-TS/LR 150W/S/230/RX7S	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	25	p45

Tubular Sodium Lamps

Product features:

- Reliable and robust technology
- Service life tuned in with maintenance intervals
- Yellow light saves insects
- Wavelength range stimulates plant growth



1



RNP-T/XLR Super

h h d (mm) l (mm) pcs.



E27 2000 25 230

1	34418089	RNP-T/XLR 50W/S/230/E27	A	52	4200	81	40000	22000	39	156	12
1	34418090	RNP-T/XLR 70W/S/230/E27	A+	71	6400	90	44000	26000	39	156	12



E40 2000 25 230

1	34418091	RNP-T/XLR 100W/S/230/E40	A+	100	10300	103	48000	28000	47	210	12
1	34418092	RNP-T/XLR 150W/S/230/E40	A+	152	18000	118	48000	28000	47	210	12
1	34418093	RNP-T/XLR 250W/S/230/E40	A+	255	33200	130	48000	28000	47	257	12
1	34418094	RNP-T/XLR 400W/S/230/E40	A++	400	56500	141	48000	28000	47	285	12



Technical Specifications for Operation

34418089	RNP-T/XLR 50W/S/230/E27	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34418090	RNP-T/XLR 70W/S/230/E27	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34418091	RNP-T/XLR 100W/S/230/E40	CCG + ECG	114	1.2	1.2	12	3.3 to 5.0	h180
34418092	RNP-T/XLR 150W/S/230/E40	CCG + ECG	170	1.8	1.8	20	3.3 to 5.0	h180
34418093	RNP-T/XLR 250W/S/230/E40	CCG + ECG	280	3.0	3.0	32	3.3 to 5.0	h180
34418094	RNP-T/XLR 400W/S/230/E40	CCG + ECG	434	4.5	4.6	45	3.3 to 5.0	h180

Further technical information from page 68.



1



RNP-T/LR Super

h h d (mm) l (mm) pcs.



E27 2000 25 230

1	34411050	RNP-T/LR 50W/S/230/E27	A	50	4200	81	28000	16000	36	156	12
1	34415211	RNP-T/LR 70W/S/230/E27	A+	71	6400	90	30000	16000	36	156	12



E40 2000 25 230

1	34410170	RNP-T/LR 100W/S/230/E40	A+	100	10300	103	36000	20000	47	210	12
1	34410738	RNP-T/LR 150W/S/230/E40	A+	152	17500	115	36000	20000	47	210	12
1	34410739	RNP-T/LR 250W/S/230/E40	A+	255	31900	125	36000	20000	47	257	12
1	34411127	RNP-T/LR 400W/S/230/E40	A++	400	54800	137	36000	20000	47	285	12
1	34411907	RNP-T/LR 600W/S/230/E40	A++	600	90000	150	32000	20000	47	285	12



RNP-T Standard

h h d (mm) l (mm) pcs.



E40 2000 25 230

1	34404708	RNP-T 1000W/230/E40	A++	960	130000	135	20000	8000	66	360	12
---	----------	----------------------------	-----	-----	--------	-----	-------	------	----	-----	----



Technical Specifications for Operation

34411050	RNP-T/LR 50W/S/230/E27	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34415211	RNP-T/LR 70W/S/230/E27	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34410170	RNP-T/LR 100W/S/230/E40	CCG + ECG	114	1.2	1.2	12	3.3 to 5.0	h180
34410738	RNP-T/LR 150W/S/230/E40	CCG + ECG	170	1.8	1.8	20	3.3 to 5.0	h180
34410739	RNP-T/LR 250W/S/230/E40	CCG + ECG	280	3.0	3.0	32	3.3 to 5.0	h180
34411127	RNP-T/LR 400W/S/230/E40	CCG + ECG	434	4.5	4.6	45	3.3 to 5.0	h180
34411907	RNP-T/LR 600W/S/230/E40	CCG	635	6.2	6.2	65	3.6 to 5.0	h180
34404708	RNP-T 1000W/230/E40	CCG	1030	10.6	10.3	100	4.0 to 5.0	h180

Sodium Lamps with Elliptical Bulb

Product features:

- Reliable and robust technology
- Service life tuned in with maintenance intervals
- Yellow light saves insects
- Wavelength range stimulates plant growth



1



RNP-E/XLR Super

h h d (mm) l (mm) pcs.



E27 2000 25 230

1	34418095	RNP-E/XLR 50W/S/230/E27	A	52	4200	84	40000	22000	71	156	12
1	34418096	RNP-E/XLR 70W/S/230/E27	A+	71	6400	90	44000	26000	71	156	12



E40 2000 25 230

1	34418097	RNP-E/XLR 150W/S/230/E40	A+	152	17600	116	48000	28000	91	226	12
1	34418098	RNP-E/XLR 250W/S/230/E40	A+	255	31600	124	48000	28000	91	226	12



Technical Specifications for Operation

34418095	RNP-E/XLR 50W/S/230/E27	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34418096	RNP-E/XLR 70W/S/230/E27	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34418097	RNP-E/XLR 150W/S/230/E40	CCG + ECG	114	1.2	1.8	20	3.3 to 5.0	h180
34418098	RNP-E/XLR 250W/S/230/E40	CCG + ECG	170	1.8	3.0	32	3.3 to 5.0	h180

Further technical information from page 68.



1



RNP-E/LR Super

h h d (mm) l (mm) pcs.



E27 2000 25 230

1	34418951	RNP-E/LR 50W/S/230/E27	A	52	4000	77	28000	16000	71	156	12
1	34418952	RNP-E/LR 70W/S/230/E27	A+	71	6400	90	30000	16000	71	156	12



E40 2000 25 230

1	34410734	RNP-E/LR 100W/S/230/E40	A+	100	10100	101	36000	20000	76	183	12
1	34418953	RNP-E/LR 150W/S/230/E40	A+	152	17000	112	36000	24000	91	226	12
1	34418954	RNP-E/LR 250W/S/230/E40	A+	255	31600	124	36000	24000	91	226	12
1	34418955	RNP-E/LR 400W/S/230/E40	A++	410	55400	137	36000	24000	122	290	12



Technical Specifications for Operation

34418951	RNP-E/LR 50W/S/230/E27	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34418952	RNP-E/LR 70W/S/230/E27	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34410734	RNP-E/LR 100W/S/230/E40	CCG + ECG	114	1.2	1.2	12	3.3 to 5.0	h180
34418953	RNP-E/LR 150W/S/230/E40	CCG + ECG	170	1.8	1.8	20	3.3 to 5.0	h180
34418954	RNP-E/LR 250W/S/230/E40	CCG + ECG	280	3.0	3.0	32	3.3 to 5.0	h180
34418955	RNP-E/LR 400W/S/230/E40	CCG + ECG	451	4.4	4.6	45	3.3 to 5.0	h180



1



RNP-E .../I

h h d (mm) l (mm) pcs.



E27 2000 25 230

1	34418915	RNP-E 50W/I/230/E27	A	50	3600	72	24000	9000	71	156	24
1	34407813	RNP-E 70W/I/230/E27	A	70	5900	84	24000	12000	71	156	24



Technical Specifications for Operation

34418915	RNP-E 50W/I/230/E27	KVG	62	0.8	0.8	10	-	hs30
34407813	RNP-E 70W/I/230/E27	KVG	82	1.0	1.0	12	-	hs30

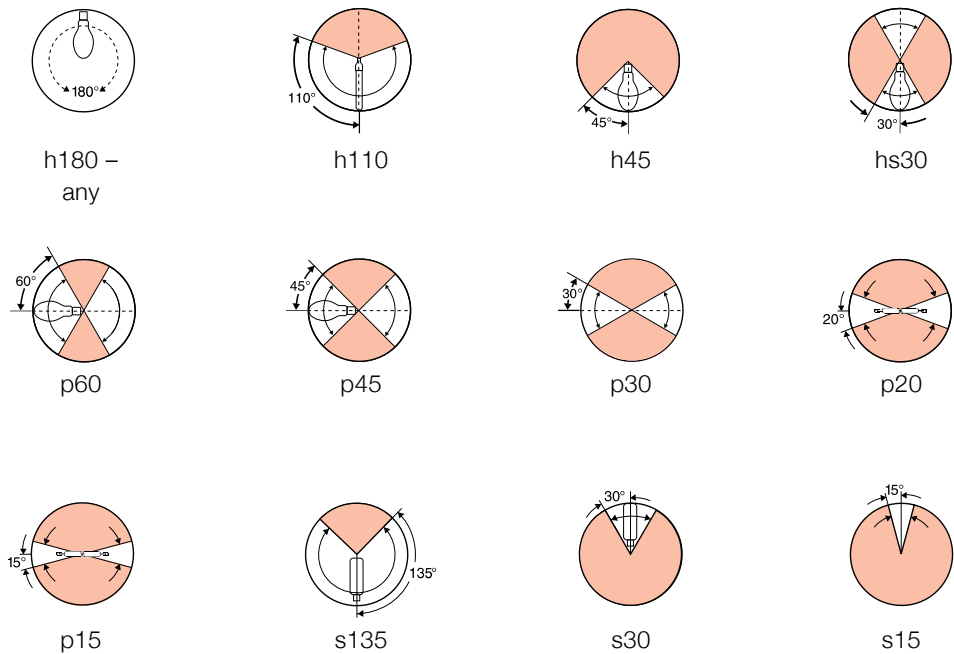
Further technical information from page 68.

Overview of Important Information.

Technical Information.



Burning positions



The stated burning positions must be observed. Failure to do so can e.g. lead to premature failure of the lamps.

Key

s = Vertical position, base down

h = Vertical position, base up

p = Horizontal position, base at the side

Permissible angle of inclination:

The number after the fundamental burning position denotes the permissible inclination in angle degrees to either side of that.

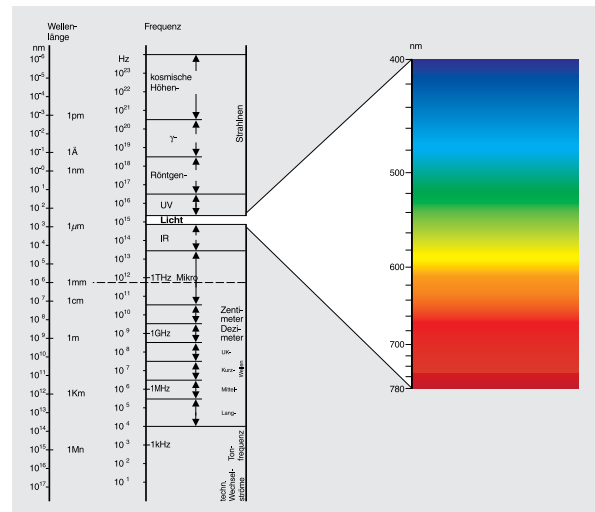
For lamps with a filament field as an area the inclination of the denoted burning position is only permissible so that branches of the filament do not lie behind one another.

What is Light?

Light and Radiation.

Electromagnetic radiation

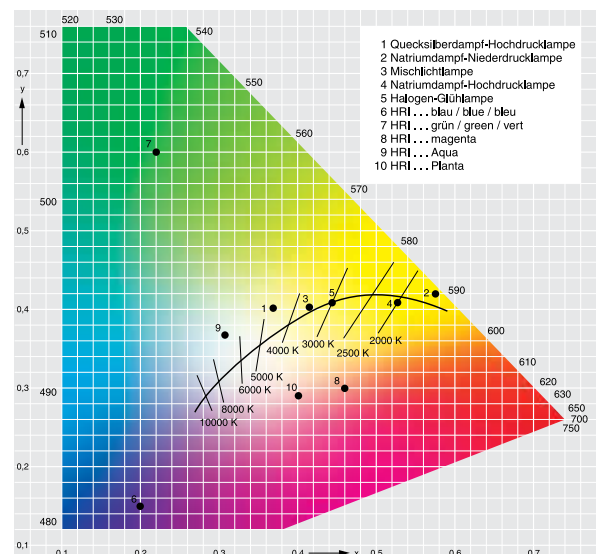
The term light refers to electromagnetic radiation provoking a sensation of brightness in the human eye, i. e. this radiation can be perceived by the eye. This refers to the radiation range between 380 and 780 nm which is only a tiny part of the spectrum of electromagnetic radiation we know.



Colour locus and colour coordinates

Extract from the CIE colour triangle with Planck's plot including the colour locus of the most important lamps for general illumination.

These colour coordinates are the most exact way to describe the light colour of a lamp.

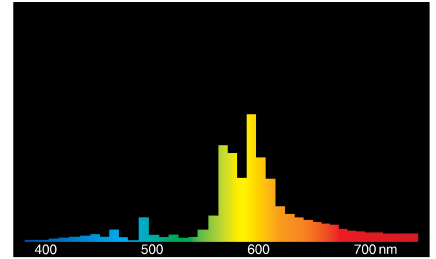




Spectral distribution of radiation

High Pressure Sodium Vapour Lamps.

Because of their high luminous efficacy and their long service life, sodium vapour lamps are considered exceptionally economical.



Standard/Super

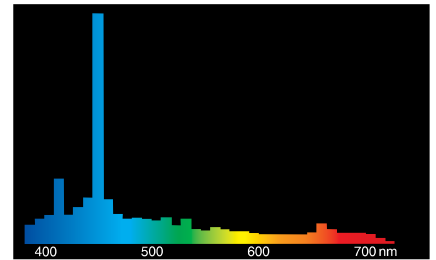
Metal Halide Lamps

RCC ... Ceramic burner lamps with especially good colour rendering in the red range

HRI ... Quartz burner lamps with or without outer bulb

HRI ... /B/... (blue) for aquarium and effective outdoor illumination

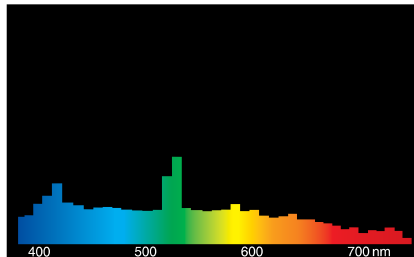
HRI ... /NSC/...: Very high luminous efficacy with good colour rendering also refer to page 54 and 57



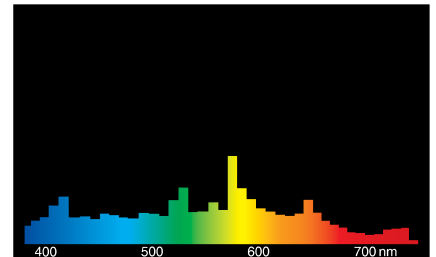
HRI ... /B/Aquastar

Legend:

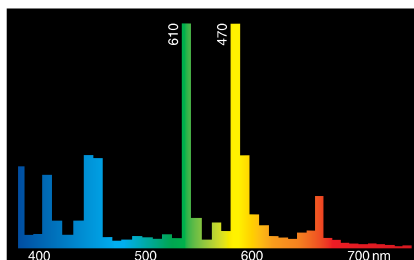
- ... /WDL Warm white DE LUXE
- ... /D Cool white (daylight)
- ... /NDL Neutral white DE LUXE
- ... /N Neutral white
- ... /NSc Neutral white



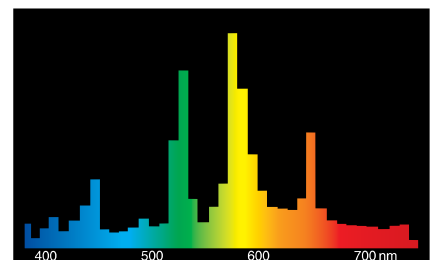
HRI ... /D



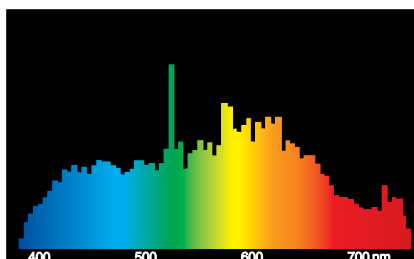
HRI ... /NDL



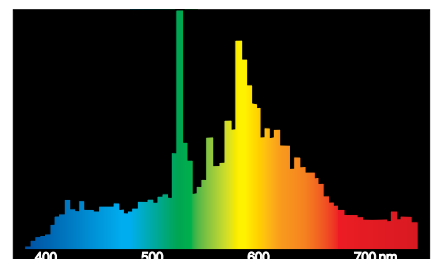
HRI ... /N und HRI ... /NSC



HRI ... /WDL



RCC ... /NDL



RCC ... /WDL



Colour Rendering Characteristics according to EN 12464-1

Colour Rendering Characteristics

Light colour

Group	Index R _a	> 5300 K Cool white	≈ 4000 K Neutral white	< 3300 K Warm white
1 Very good	1A R _a 90-100	HRI ... /D	RCC ... /NDL LED ... /940	Incandescent lamps Halogen lamps LED ... /930 LED ... /927 RCC ... /WDL
	1B R _a 80-89	LED* ... /865 Ralux® ... /865 Bonalux® ... /865 Spectralux® ... /865 Skylux ... /880 HRI ... /D	LED* ... /840 Ralux® ... /840 Bonalux® ... /840 Spectralux® ... /840 HRI ... /NDL	LED* ... /830 LED* ... /827 Ralux® ... /830 Ralux® ... /827 Bonalux® ... /830 Spectralux® ... /830 Spectralux® ... /827 HRI ... /WDL RCC ... /WDL
2 Good	2A R _a 70-79			HRI ... /WDL
	2B R _a 60-69		NL-Standard ... /640 HRI ... /N HRI ... /NSc	
3 Less good	R _a 40-59			
4 Not good	R _a 20-39			RNP ... Super RNP

*LED-Retrofit, LED-Strips and Luminaires

Notes on Metal Halide Lamps

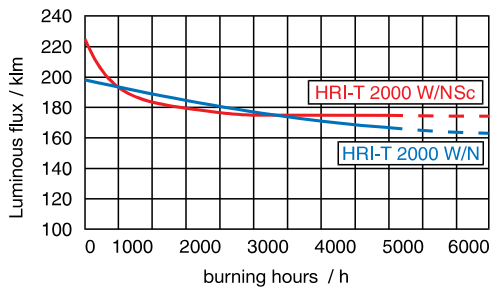
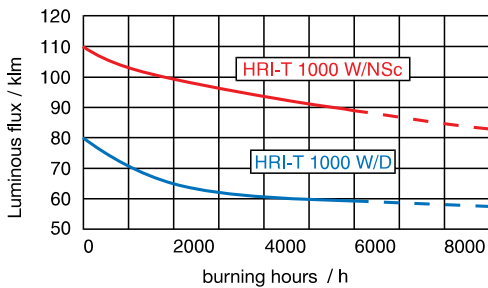
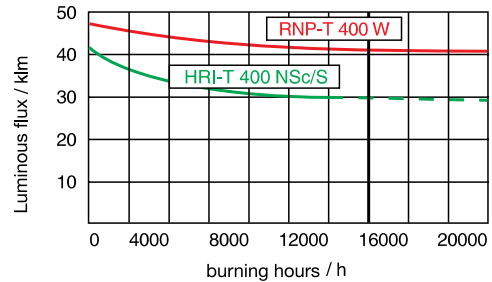
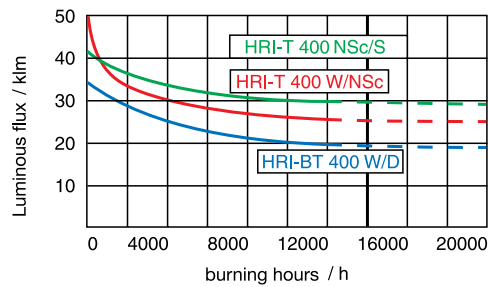


Dimming Behaviour

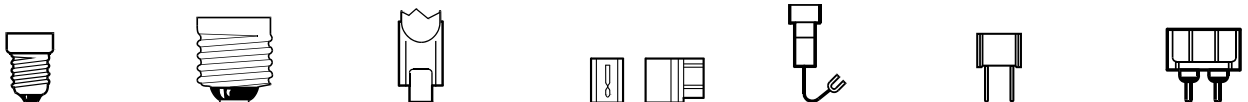
The higher thermal robustness of the round shape burner ceramics enables an improved dimming behaviour regarding luminous efficiency and colour rendering compared to metal halide lamps with quartz burner. With dimming a wandering of chromatic coordinates still happens. Lamps operated with dimming have got a stronger decrease of luminous flux and more deviation of colour coordinates over the lamp's life. The way of dimming has got great influence on the results, here. We recommend dimming by controllable square-ECG, we advise completely against dimming by voltage reduction or by leading edge control. We cannot guarantee that lamps in dimmed operation meet their assured properties. RNP lamps can be operated with reduced power up to 50% of nominal power by impedance change if their start takes place at nominal power.



Luminous flux maintenance



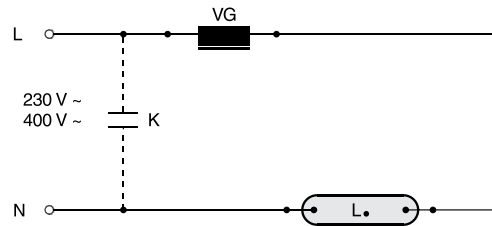
Lamp Bases (DIN-EN 60061-1)



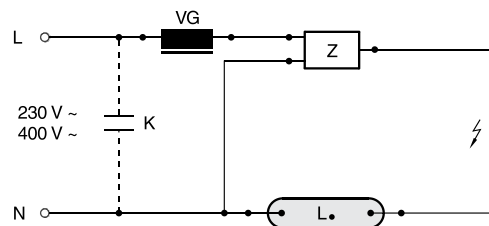
E27	E40	RX7s-24	Fc2	K12s-36	G8.5	G12
Sheet 7004-21-10	Sheet 7004-24-6	Sheet 7004-92A-4	Sheet 7004-114-1	Sheet 7004-168-1	Sheet 7004-122-3	Sheet 7004-63-2

Circuit Examples

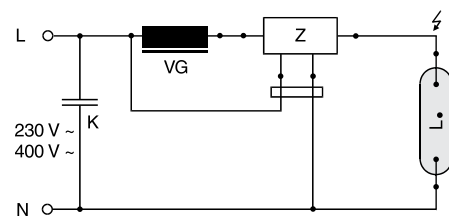
Metal Halide Lamps High Pressure Sodium Vapour Lamps



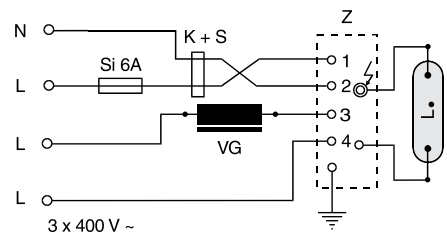
Standard circuit for all HRI, RNP with internal igniter



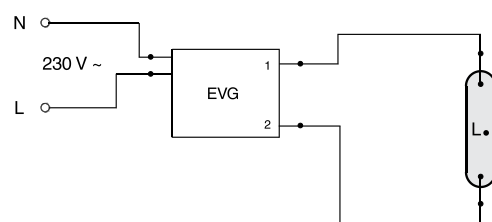
Standard circuit for all RCC, HRI, RNP for external ignition



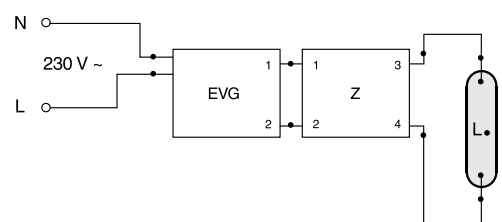
Superimposed electronic igniter ZG 3 for hot re-strike lamps



Superimposed electronic igniter ZG 4 for hot re-strike lamps without outer bulb



Circuit with ECG



Circuit with ECG and igniter

Notes on installation

Lamp and ballast may be installed in arbitrary distance, whereas the distance between lamp and igniter must not be more than approx. 1.5m. Please switch off a luminaire/ flood light without lamp in order to avoid overload by continuous operation of the igniter. If the centre lead is not used in three-phase installations and only the common leads are fused, resonance/ resonant circuits may occur. This way lamps and operation gear may be damaged or even destroyed. One-based lamps with big outer bulbs (e.g. HRI \geq 1000W, RNP-T 1000W) need some support/ stress-strain relief at the opposite end from the base. For employed/ planned luminaires/ flood lights EN 60598-1 (thermal properties and electric fusing) is to be observed. Guarantee will not be applicable when lamps are operated in improper armatures and in not permitted conditions.

Technical information on high pressure discharge lamps

Lamp type

Metal Halide Lamps

High Pressure Sodium Vapour Lamps

Mains voltage



230V ~ ± 3%;
for 2000W-Lamps 400V ~ ± 3%
temporary oscillation of ± 5%
extinction of the lamp is possible with sudden oscillation ≥ ± 10%.

230V ~ ± 3%;
for 2000W-Lamps 400V ~ ± 3%
temporary oscillation of ± 5%
extinction of the lamp is possible with sudden oscillation ≥ ± 10%.

Ballasts

See circuit examples
page 73

Choke coil, possibly with thermal circuit breaker (maybe + transformer, if mains voltage < 95%)

Choke coil, possibly with thermal circuit breaker

Ignition and run-up characteristics



appropriate igniter required;
exception: lamps with internal igniter
see table page 75

appropriate igniter required;
exception: lamps with internal igniter
see table page 75

full luminous flux after approx. 1-4 min.,
140% up to 190% run-up current

RNP: full luminous flux after approx.
6-10 min., 125% run-up current

Reignition



After extinguishing the lamps require some minutes for reignition depending on lamp type and cooling circumstances. Nearly all TS-lamps can be reignited immediately with suitable igniters.

RNP lamps with external igniter have got a reignition period of about one minute. RNP.../I lamps with internal igniters need about 5 minutes.

Fuses

Fuses for all discharge lamps must be proportioned for short time current peaks and the increased run-up current (up to 2 times the nominal current). We recommend using time lag fuses and automatic devices (switching off characteristics 'C'). See special instructions for the fuses of metal halide lamps.

Power factor



When operated with a ballast the capacity $\cos \varphi$ of HRI- and RNP lamps is about 0,5 . . . 0,7. For information on capacitors please see tables 'Technical Specifications for Operation', also refer to notes for fluorescent lamps p.41.

Luminous flux



The values of the luminous flux always refer to the quoted burning position and the nominal wattage of the lamps. They are determined after 100 burning hours with reference gear at laboratory conditions. They are practically independent of the ambient temperature. Planning note: decline in luminous flux, cf. product data sheet. Depending on external influences such as mains voltage, control gear, burning position and luminaire design, color deviations are possible. When real burning position does not comply with that stated, dramatic changes are to be expected especially in luminous flux, colour temperature and service life. Technical data for RCC/HRI lamps 250-1000W can only be achieved when operated with RNP ballast. (Exception: HRI-T 400W blue).

Radio interference

Radio interference normally does not occur except for switching the lamp on. Please, never use capacitors for HRI-lamps, because they need an impulse of high frequency voltage for ignition!

Operation off nominal conditions

Short switching cycles (< 3h on, ½ h off) shorten the lamp's life. Therefore, operation on demand such as with a motion detector is not sensible. At low temperatures < -20°C (down to -50°C) lamps start for sure only with external, especially suited, heated igniters.

Reduction of power (additional impedance) of 50% is possible for RNP when starting with nominal conditions. This is not applicable for HRI and RCC, because there changes of colour can occur and/or shortening of life time.

Safety at operation

Because of the emitted UV-radiation and of the high operating pressure as a principle all HRI and RCC are to be used in suitable fully closed luminaires/flood lights, if admission for operating in open fixtures is not specifically stated for this lamp. As a breakage of the lamp bulb cannot be excluded, luminaires must be fitted with a temperature-change resistant and fracture safe front screen and thus keep hot metal, ceramic or glass particles inside. Operation of lamps with damaged outer bulb is dangerous and not approved.

At the end of lamps' service life there may occur rectifier effects, which may lead to overheating of the ballasts by direct current. Therefore, protection is to be provided for acc. to IEC 62035 (thermal circuit breaker). Circuits which can cause resonance effects are to be avoided as a rule due to the danger of destruction of lamps, ballasts or capacitors by those periodic oscillations.

Please, change lamps promptly at the end of their service life which show any one of the following properties: change of colour, loss of light, no ignition, periodic ignition and extinction.

Operation of discharge lamps



HRI-E 250, 400, 1000W	230	yes + ZG1	no	no
HRI-T 70, 150, 250W	230	yes + ZG1	no	yes
HRI-T 400, 1000W	230	yes + ZG1	no	no
HRI-T 2000W.../!... ¹	400	yes	no	no
HRI-T 2000W	400	yes + ZG2	no	no
HRI-TS 70, 150, 250W	230	yes + ZG1 o. ZG3	no	yes
HRI-TS 400, 1000W	230	yes + ZG1 o. ZG3	no	no ³
HRI-TS 2000W	400	yes + ZG1 o. ZG4	no	no ³
RCC-E/P 35, 70, 100, 150W	230	yes + ZG1	no ²	yes
RCC-T 35, 70, 150W	230	yes + ZG1	no ²	yes
RCC-TC 20W	230	no	no ²	yes
RCC-TC 35, 70W	230	yes + ZG1	no ²	yes
RCC-TS 70, 150W	230	yes + ZG1	no ²	yes
RNP-E 50, 70W.../!... ¹	230	yes	no	no
RNP-E 50, 70, 100, 150, 250W/S	230	yes + ZG1	up to 50%	yes
RNP-T 50, 70, 100, 150, 250W/S	230	yes + ZG1	up to 50%	yes
RNP-TS 70, 150W	230	yes + ZG1	no	yes
RNP-...≥400W	230	yes + ZG1	up to 50%	no

1 Lamp with integrated starter

2 may be controlled when operated with LEDVANCE PT03DIM

3 apart from lamps especially for ECG

Explanation of abbreviations/legend

V: Mains voltage

Dimmable: The lamp can be controlled

CCG: Conventional choke coil

ECG: Electronic ballast

ZG1: Superimposed electronic igniter 230 V

ZG2: Superimposed electronic igniter 400V

ZG3: Instant igniter 230V

ZG4: Instant igniter 400V

Those for special applications and those for the whole world.

Signal Lamps and Non-EU Lamps without CE Marking.

Special lamps are still needed today for some fields of application, such as for airfield lighting with current-controlled halogen incandescent lamps. In ship navigation lanterns and in traffic signal systems (traffic lights), there are still many older installations that require incandescent lamps as replacement equipment.

Since this is simple, robust technology, the lamps are easy to operate and replace. Disposal is also no problem.

In Europe, high expectations are placed on light sources, which can no longer be met by inexpensive, simple and robust products, but which are still in demand internationally. Such products are then shipped without CE marking directly from the production facility outside Europe to customers outside Europe as well.



Signal Lamps.

Lamps for navigation lights	77
Lamps for navigation lights, Form E	78
Lamps for navigation lights, Form B	78
Low voltage-traffic lamps	79
Mains voltage-traffic lamps	79
Mains voltage-traffic lamps with krypton	79

Product features:

- Reliable and robust technology
- Halogen lamps for airfield lighting
- Current-controlled halogen lamps



Halogen lamps for airfield lighting

d (mm) l (mm) mm mm pcs.

	R7s	C	p15	1000h								
1	24418109		RHA 100W/6,6A/R7S		100	6.60	4400	12	65.6	60.2	6.5	25
1	24401619		RHA 200W/6,6A/R7S		200	6.60	2000	14	65.6	60.2	8.4	25
1	24413713		RHA 200W/8,33A/R7S		200	8.33	4400	65	65.6	60.2	9.5	25
2	24424812		RHA 200W/6,6A/L*		200	6.60	4400	14	56.0	-	8.4	25

* no base R7s, just cable

Lamps for navigation lights

Product features:

- Reliable and robust technology
- Signal lamps for navigation lights
- Approved by the German Federal Maritime Office, Hamburg



Lamps for navigation lights, Form E

d (mm) l (mm) mm pcs.



BAY15d any 1000h

1	26109210	SN-T 10W/1212U/12/BAY15D	10	12	-	12	55	70	35	100
1	26109213	SN-T 10W/2412U/24/BAY15D	10	24	-	12	26	70	35	100
1	26109215	SN-T 25W/1230U/12/BAY15D	25	12	-	30	26	70	35	100
1	26109220	SN-T 25W/2430U/24/BAY15D	25	24	-	30	26	70	35	100



Lamps for navigation lights, Form B

d (mm) l (mm) mm pcs.



P28s s30 1000h

2	26122915	SN-T 40W/2450C/24/P28S*	40	24	-	50	39	108	45	100
2	26122916	SN-T 60W/1150C/110/P28S*	60	110	-	50	39	108	45	100
3	26122917	SN-T 65W/2250C/230/P28S*	65	230	-	50	39	108	45	100

* Discontinued product, only while stocks last.

Traffic Lamps

Product features:

- Reliable and robust technology
- Lamps for traffic signal systems (traffic lights)
- Individual service life tuned in with maintenance intervals



W	V	lm	B50	B2				
			h	h	d (mm)	l (mm)	mm	pcs.

Low voltage-traffic lamps



BA20s s135

1	11411067	SVA-NUE 20W/10/BA20S	22	10	270	11000	4000	36	67	31	100
---	----------	-----------------------------	----	----	-----	-------	------	----	----	----	-----

W	V	lm	B50	B2				
			h	h	d (mm)	l (mm)	mm	pcs.

Mains voltage-traffic lamps



E27 s135

2	11411288	SVA 40W/220-240/C/E27	40	220-240	230	8000	3000	12	110	69	100
---	----------	------------------------------	----	---------	-----	------	------	----	-----	----	-----

W	V	lm	B50	B2				
			h	h	d (mm)	l (mm)	mm	pcs.

Mains voltage-traffic lamps with krypton



E27 s105

3	11413921	SVA-K 60W/230-240/C/E27	60	230-240	380	8000	3000	62	91	69	100
3	11411060	SVA-K 75W/230-240/C/E27	75	230-240	520	8000	3000	62	91	69	100
3	11419360	SVA-K LL 60W/230-240/C/E27	60	230-240	380	14000	6000	76	91	69	100
3	11419361	SVA-K LL 75W/230-240/C/E27	75	230-240	540	14000	6000	76	91	69	100

Further technical information from page 80.

Overview of Important Information.

Technical Information.

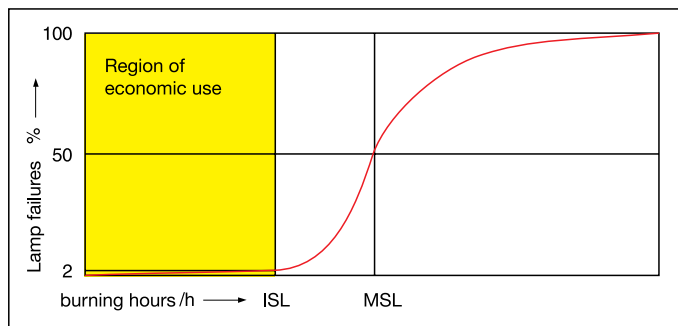
Service life for traffic light lamps

B2

The B2 service life (individual service life - ISL) is the time during which a lamp remains functional if it is tested under standardized operating conditions. Individual service life up to a failure rate of 2 %: the time during which 2 % of the lamps reach the end of their individual service life (cf. line ISL in diagram).

B50

B50 average life (MSL): the arithmetic mean of all the individual service lives of a number of lamps tested under standardized conditions (cf. line MSL in diagram).



Non-EU Lamps without CE Marking.



NL Standard fluorescent lamps

81

RNP standard sodium

vapour lamps

82



1



NL Standard fluorescent lamps

d (mm) l (mm) pcs.



G13

13000h

70-79

1	31118771	NL-T8 18W/765/G13 EX	B	18	1050	58	6500	●	370	4.5	26	590	25
1	31118772	NL-T8 36W/765/G13 EX	A	36	2500	69	6500	●	430	4.5	26	1200	25
1	31118773	NL-T8 58W/765/G13 EX	A	58	4000	69	6500	●	670	7.0	26	1500	25

Further technical information from page 37.

Non-EU High pressure sodium vapour lamps

Product features:

- Reliable and robust technology
- Cost-efficient maintenance
- No CE marking, no distribution in the EU



1



RNP standard sodium vapour lamps

h h d (mm) l (mm) pcs.



E40 2000 25 230

1	34418369	RNP-T 100W/230/E40 EX	A+	100	9000	93	20000	8000	47	210	12
1	34416635	RNP-T 150W/230/E40 EX	A+	150	15000	100	20000	8000	47	210	12
1	34416636	RNP-T 250W/230/E40 EX	A+	255	28000	110	20000	8000	47	257	12
1	34422204	RNP-T 400W/230/E40 EX	A+	400	48000	112	20000	8000	47	285	12



Technical Specifications for Operation

34418369	RNP-T 100W/230/E40 EX	CCG	115	1.2	12	4.0 to 5.0	h180	
34416635	RNP-T 150W/230/E40 EX	CCG	170	3.0	20	4.0 to 5.0	h180	
34416636	RNP-T 250W/230/E40 EX	CCG	275	3.0	32	4.0 to 5.0	h180	
34422204	RNP-T 400W/230/E40 EX	CCG	440	4.6	45	4.0 to 5.0	h180	

Further technical information from page 68.



CE Marking for Luminaires, Lamps and Lighting Fixture Accessories

Taking effect of 01.01.1996, products falling within the applicability of EU Directives concerning electromagnetic compatibility (EMC Directive) must be identified by the CE marking, since Lisbon treaty is in power from Dec 1st 2009 all products must be marked which are regulated in EU directives. The compliance with the major requirements of these directives is declared by this CE marking. Our products do of course fulfill the conditions of the applicable EU Directive and are identified accordingly with the CE marking, except for appropriately labeled products that are intended for export outside the EU.

Here follow explanatory notes on the CE marking:

1. CE marking as a prerequisite for bringing products into circulation

Manufacturers and importers are obliged within the scope of their responsibility, to identify those products, packaging or accompanying papers with the CE marking. The CE marking is a condition for the sale within the EU and hence a prerequisite for bringing a product into circulation for the first time. By the CE marking, manufacturers and importers are acknowledging the compliance of their products with the "fundamental requirements" of specific European Directives and meet the protection objectives of these directives (e.g. electromagnetic compatibility, energy efficiency). Compliance with the "fundamental requirements" is, as a rule, given when the applicable, harmonized European standards have been observed throughout the manufacture of the products.

2. The CE marking is an administration symbol

The CE marking is an administration symbol which is directed towards the state surveillance authorities. The CE marking expresses to these authorities the compliance with European regulations at the time of bringing the designated product into circulation.

3. No right by the trade or consumer to review the conformity certificates of the manufacturer

The right to request and review the certificates of conformity is exclusively assigned to those market surveillance authorities, which have a controlling function for compliance of statutory safety requirements for electrical/electronic products. In Germany these are the Federal Office for Post and Telecommunications BAPT (responsibility in matters of the EMC Directive) and the trade supervisory authority (responsibility in matters of the Low-Voltage Directive).

4. The CE-Designation is not a symbol of quality or testing






The CE marking refers only to the compliance of statutory established "fundamental requirements" of certain directives. In no way does it thereby provide an indication as to the quality of the designated product. As statutory prescribed administration symbol the CE marking shall not be mistaken for testing symbols given by independent testing institutions (such as the ENEC or VDE symbol). Neither do these testing institutions attest whether a product has been rightly identified with the CE marking.

Overview of Important Information.

Pictograms, other Icons and Notes.

Explanation of pictograms

 Power consumption (W)	 Mode of operation, ballast
 Power consumption with ballast (W)	 Suitable for electronic ballast (ECG, HF-operation)
 Power factor	 Suitable for conventional ballast (CCG/LLCG, 50Hz-operation)
 Mains voltage (V)	
 Output voltage (V)	 Light colour
 Nominal current (A)	 Code light colour
 Nominal choke current (A)	 Code light colour old
 Nominal current (mA)	 Luminous efficiency (lm/W)
 Series connection	 Light centre (mm)
 Output frequency (Hz)	 Luminous intensity (cd)
 Compensation capacitor (μF, 50Hz-operation)	 Luminous flux (lm)
 Ignition voltage (kVs)	 Luminous flux maintenance
 Hot restrike voltage (kVs)	

 K	Colour temperature (K)	 Temperature behaviour
 CRI	Colour rendering index R_a	 Permissible range of ambient temperatures (°C)
 Mean luminance (cd/cm²)		 Life in General (h)
 UV radiation reduced (UV-EX)		 Mean service Life (h)
 IRC	IIRC Technology (IRC = infrared reflective coating)	 95% survival rate (h)
 Beam angle (°)		 98% survival rate (h)
 Burning position		 Ingress protection rating
 Dimmable		 Protection class II
 Base (Example here: screw base)		 Information
 Spectral distribution		 CE Marking
 Lamp type		 EU-date of phase-out
 Structural shape T5 HE		 Burning in
 Structural shape T5 HO		 Energy label according to EU-directive 874/2012
 Structural shape T8		 Suitable for open fixtures
 Structural shape Ring		 Box quantity lamps (pcs.)
 Compact fluorescent lamp		 Box quantity other products (pcs.)
 Dimensions of a lamp (mm)		 WEEE waste bin (= not to be disposed of via household waste, more information at www.radium.de/recycling or on p.87)
 Dimensions of other products (mm)		 MIG. Made in Germany
 Distance between electrical contacts (mm)		

Icons on our packaging



Operation of lamp in closed luminaire, i.e. with protective cover, only



Operation in open fixtures, i.e. without protective cover, permissible



Do not touch lamp with bare fingers



Open packaging, read instructions



Read instruction leaflet before use



Not suitable for children



When installing touch casing, only



Do not touch glass bulb, when installing touch casing



Do not use lamps with scratched or damaged glass bulb



Operation with damaged outer bulb not permissible



Burning position restriction for candle lamps. Additional text prevents 'wrong' interpretation



Operation indoors, only



When changing lamp unplug luminaire from mains



Before doing maintenance work unplug electronic ballast from mains



Lamp cannot be dimmed



Attention: hot



When installing or removing lamp wear suitable gloves



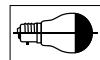
When installing or removing lamp wear suitable eye protection



Protect from splash water



'Cool Beam' dichroic lamp – emits heat to the rear



Top mirrored lamp – to be operated in special installations, only



Burning positions restrictions:
p = horizontal, h = hanging (base up), s = upright (base down), $45 \pm 45^\circ$



Installation and maintenance of electronic control gear by qualified electricians, only



Increased UV-radiation



Sterilisation lamp



Radiation danger



Operation with ballast, only



Lamp with internal igniter



Lamp for external igniter



Disposal of lamps and luminaires, for example in Germany

In order to protect the environment and human health and to preserve valuable raw materials, electrical devices - including lamps and luminaires - should be treated properly after their end of use:

Recycling where possible, environmentally friendly disposal where necessary. For this purpose, the legislature created the WEEE (EU) and the ElektroG (D). For the respective legislation in your country contact the local authorities, please.

ElektroG - German Electrical and Electronic Equipment Act

The EU directive on the disposal of waste electrical and electronic equipment (= WEEE) was introduced into national law in Germany in 2005 as the Electrical and Electronic Equipment Act (ElektroG).

On July 10, 2015, the Federal Council passed the ElektroG (2), which includes, among other things, further information obligations. Another new edition is already work in progress, but a release date is not yet known.

Every manufacturer must register with the national waste electrical and electronic equipment register (EAR). Goods from unregistered manufacturers may no longer be sold since November 24, 2005. Radium is registered in Germany under the number DE 36655118.

You can recognize all Radium products that have to be disposed of separately according to the WEEE directive by the symbol of the crossed-out waste bin.



In the category light sources, this affects fluorescent lamps, compact fluorescent lamps and discharge lamps (disposal fee in Germany as of January 2021 € 0.13 / piece), as well as LED retrofit lamps (disposal fee in Germany € 0.08 / piece). The guideline also includes technical luminaires and their components such as starters, control gear and built-in light-emitting diodes. As of today, these are (still) free of charge, but the sales figures must also be reported here.

All consumers (commercial and private) are obliged to dispose of WEEE-labeled old lamps separately. Collection points may be available for this in retail and at recycling centres (so in Germany - check for your country where).

Practical Disposal in Germany - lightcycle

Lamps and luminaires from private households and businesses can be disposed of at municipal recycling centres. Bulbs in large numbers can be disposed of directly via Lightcycle. Incandescent lamps and halogen lamps do not contain any environmentally relevant substances and may still be disposed of with household waste.

On behalf of leading lamp manufacturers, Lightcycle organizes cost-optimized and environmentally friendly logistics processes for lamp disposal, both from the municipal recycling depots and directly.



Lightcycle bundles the transport quantities and coordinates the collection logistics.

Disposal in other Countries

In Austria, similar regulations apply as in Germany, but the so-called "collective groups" are structured slightly differently: lamps up to 80g (no matter if discharge lamps or LEDs, disposal fee as of January 2021 € 0.06 / piece), lamps from 80 g (0.14 € / piece) and luminaires (€ 0.06 / piece).

Please ask the relevant CRSO (collection, recycling and service organization) for the respective national disposal regulations.

Current information can be found on the Internet at:

www.radium.de/recycling and further at

Lightcycle

German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

German Central Association of Electrical Engineering and the Electrical Industry

All about light

German Foundation for old electrical appliances register

German Federal Environment Agency

LightingEurope

Environmental forum for household appliances of Austria

www.lightcycle.de

www.bmu.de

www.zvei.org

www.licht.de

www.stiftung-ear.de

www.uba.de

www.lightingeurope.org

www.ufh.at



The Energy Label

An energy consumption labelling system - energylabel or energy label - has been around for a long time for many products in the EU, so it is a well-known obligation.

The energy label is intended to be a simple guide to choosing and buying environmentally friendly, energy-saving products.

While in the initial phase only 'mains voltage lamps for generating light in the household' had to carry such a label, soon all light sources will be. 'Light sources' are all lamps and luminaires from which the light source cannot be removed. Luminaires with exchangeable light sources do not need an energy label.

In implementation of the framework directive from 2017, the energy efficiency label will also be 'reset' to classes A to G for light sources, taking effect from Sept 1st 2021 and will thus return to its origin 1998.

Until then, the current classes from A ++ to E will still apply.

Since the calculation formulas and the influencing factors involved differ, a simple transfer is not possible; the energy label must be newly determined.

Affected Light Sources

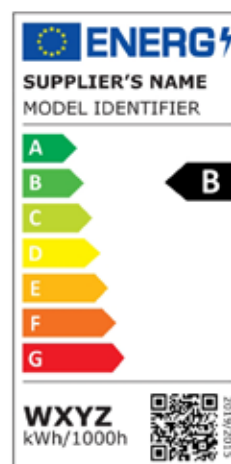


Currently effective directive EU 874/2012, in power until **Aug 31st 2021**

All lamps and LED modules with luminous flux > 30lm, explicitly quoted:

- Incandescent lamps (including halogen lamps!)
- Fluorescent lamps
- High pressure discharge lamps
- LED lamps and LED modules

Individual energy labels for our lamps can be found at the regarded product's online-datasheet for downloading.



New directive EU 2019/2015, effective from **Sept 1st 2021**

All light sources **with luminous flux between 60 and 82,000 lm**, and light generation by:

- Incandescence (Filament, i.e. incandescent and halogen lamps)
- Fluorescence (Fluorescent lamps)
- High pressure discharge
- LED / OLED (without LED-Chips, LED-Dies or LED packages)

From May 1st 2021, all light sources must be entered into the European Product Data Base (EPREL).

Exceptions are specified in more detail in the respective directives, such as special lamps or battery-operated lamps and modules, for example. The labeling obligation remains: The respective energy label must be shown on packaging, in catalogues, data sheets, offers and invoices.

Valid from / transitional regulations

Until September 1st, 2021, only the current labeling may be shown in stores!

Light sources with the then 'old' energy label that are subject to labeling have a transition period of 18 months, so they only have to show the new label from March 1st, 2023 and then the old one must be pasted over if necessary.

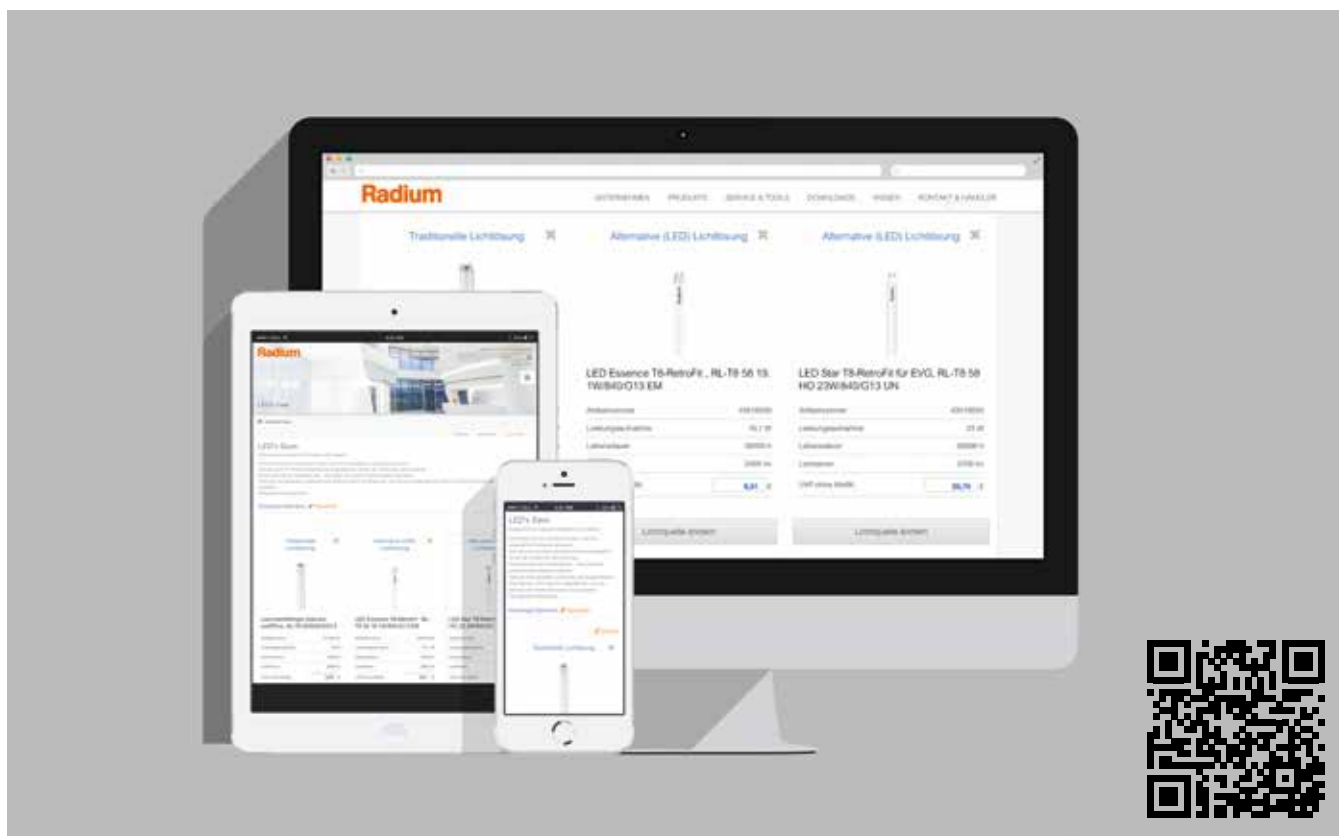
Save more energy with Radium.

LED's Save Calculator.



With so many LED products around, do you still know what's what anymore? If not, don't worry. With the LED's Save Calculator, you will find the right LED replacement product in no time at all. And so that you can see whether the exchange is really worth it, you will get a result with energy costs and payback time. Let your savings potential surprise you today.

www.radium.de/leds-save



Direct Contact.

Global Commercial Agencies.

You can find our global sales partners quickly and easily using the Radium representative search. To do this, select the continent, the country and, within Germany, the postcode - and the responsible local representative (sometimes even with their own warehouse and stock) and a contact person at the headquarters in Wipperfürth will be displayed.

Both - local partner and central office in Wipperfürth - will be happy to help you.
www.radium.de/representations



Contact form.

Is there anything you would like to tell us or do you have a question?

You can reach the responsible Radium contact person quickly and easily using the contact form.

www.radium.de/contact





Radium Lampenwerk GmbH

Dr.-Eugen-Kersting-Str. 6
51688 Wipperfürth
Germany

Phone +49 (0) 2267 811

Fax +49 (0) 2267 81353

radium@radium.de

www.radium.de