Traditional Lamps

Radium – Pioneer of Light.

The Big Catalogue of Classic Lamps.

www.radium.de/traditional

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

More than one century of lamp history.
History.

From Spinning Mill to Lamp Factory

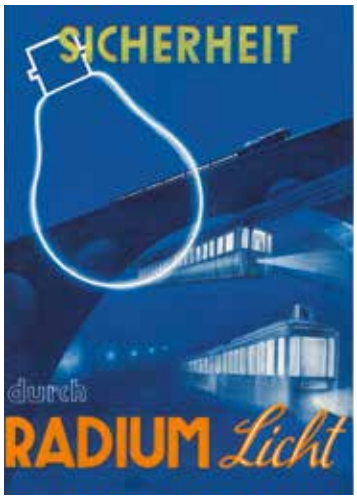
In 1902, a major fire destroyed the spinning company Drecker & Kuhlmann which was situated just outside the town of Wipperfürth. Then, on January 29th 1904 the entrepreneur Drecker founded together with Adolf Berrenberg – an employee of Edison in the U.S. – the Berrenberg-Elektrizitätswerke GmbH. On 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.').

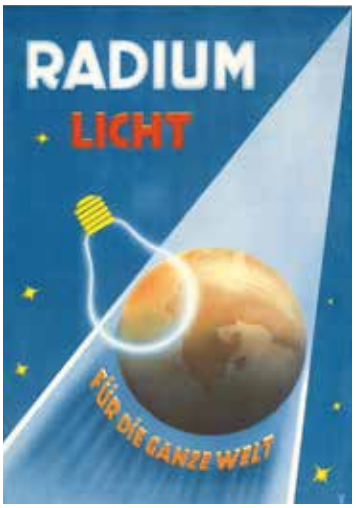
In 1907, Eugen Kersting, son of Richard Kersting, joins the enterprise and he takes over the company together with Richard Drecker after his father's death in 1917. Under the technical direction and supervision of Eugen Kersting Radium experiences a rapid and great rise in the following years.

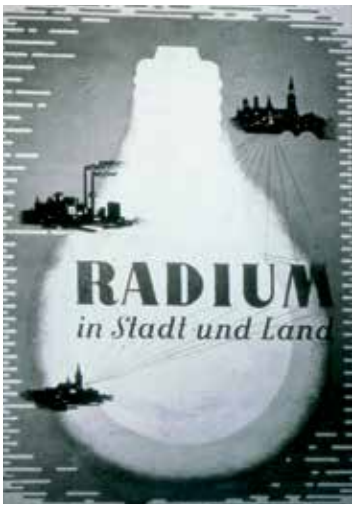
Even after the death of Eugen Kersting Radium has been involved in essential developments of lamp technology. In 1967, the first colour TV show was broadcasted in Germany. Thanks to the colour TV compatible lighting from Wipperfürth „Der goldene Schuss" ('the golden shot') can be broadcasted in colour. 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.

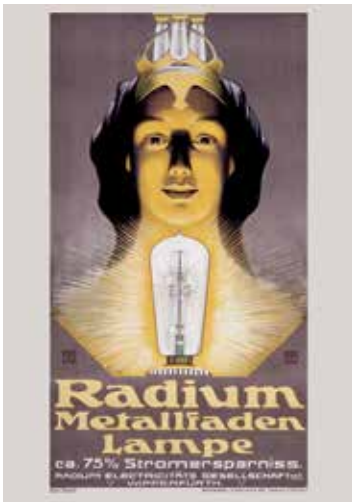
Today, at Radium many different lamp types are manufactured on either high tech manufacturing lines – from special single-unit productions to high volume series of some million parts.

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.









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 120 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.


Certificate

Standard ISO 9001:2015

Certificate Registr. No. 01 100 2000593

Certificate Holder: Radium Lampenwerk GmbH
Dr.-Eugen-Kersting-Str. 6
51688 Wipperfürth
Germany

Scope: Development, production and distribution of tungsten filament, gas discharge and UV / IR lamps, LED lamps and luminaires

Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

Validity: The certificate is valid from 2022-04-19 until 2025-04-18.

2022-04-19

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

www.tuv.com

TÜVRheinland®
Precisely Right.


Certificate

Standard ISO 14001:2015

Certificate Registr. No. 01 104 2000593

Certificate Holder: Radium Lampenwerk GmbH
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ZERTIFIZIERT

Management System
ISO 9001:2015
ISO 14001:2015

www.tuv.com
ID 9000020959

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 unsuitabe 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®
Bonalux®
Ralux®
Spectralux®
RaLEDina®
Xeradex®

Subject to change without notice. Errors and omissions excepted.

For more information refer to www.radium.de.

Partners:

ZVEI: Die Elektroindustrie

licht.de

voltimum

ETIM

IAKS International Association for Sports and Leisure Facilities

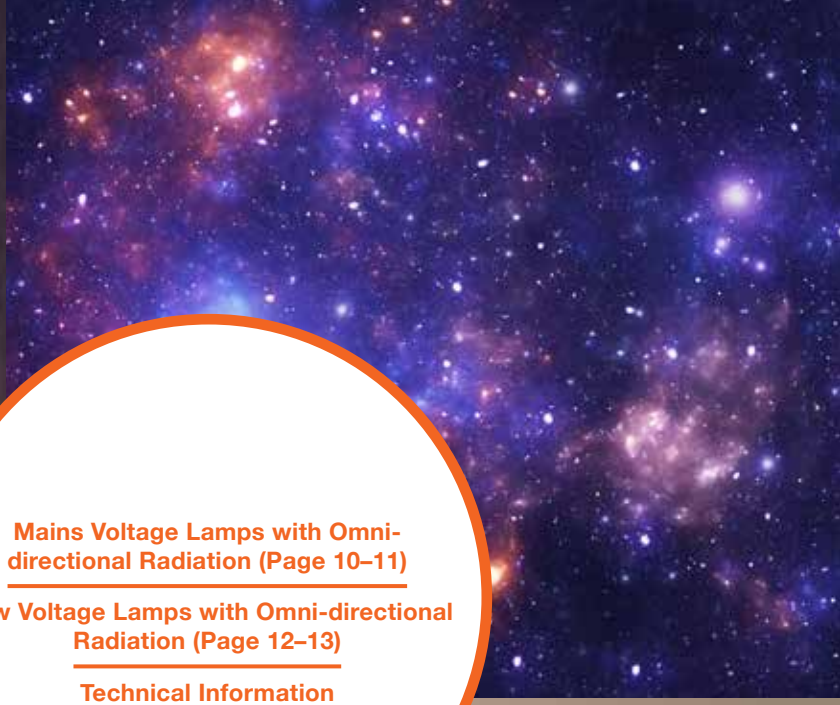
LAUTERER WETTBEWERB e.V. Verbraucher und Umwelt schützen

Lightcycle

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 10–11)

Low Voltage Lamps with Omni-directional Radiation (Page 12–13)

Technical Information (Page 16–17)

Notes on Naming Lamps (Codes for Lamp Types)

RJH-PIN **20 W** / **230** / **C** / **XE** / **G9**

- **RJH-PIN** — Lamp shape, form:
  - RJH = Mains voltage halogen
  - RJL = Low voltage halogen
  - P = Pear shape lamp
  - D = Mini ball lamp
  - PIN = Pin base lamp
  - TS = double ended
  - TSK = TS + short design
- **20 W** — Power, Wattage (W)
- **230** — Nominal Voltage (V)
- **C** / **XE** — Further Specification:
  - C = clear
  - F = frosted
  - XE = Xenon
  - 300 C = for up to 300 °C
- **G9** — Lamp Base

RJLS **35 W** / **12** / **IRC** / **WFL** / **GU5.3**

- **RJLS** — Lamp shape, form:
  - RJL = Low voltage halogen
  - RJLS = Low voltage halogen with front screen
- **35 W** — Power, Wattage (W)
- **12** — Nominal Voltage (V)
- **IRC** / **WFL** — Further Specification:
  - IRC = energy saving
  - SKY = Low pressure
  - MEGA = Glass reflector with titanium coating
  - FL = Flood (wide beam angle), ca. 24°
  - WFL = Wide Flood, ca. 36°
  - VWFL = Very Wide Flood, 60°
  - and more
- **GU5.3** — Lamp Base

Mains Voltage Lamps with Omni-directional Radiation.

1 2

Ralopin

			W	lm	d (mm)	l (mm)	pcs.	from
	G9	G / B50 2000h / V 230						
1	22319462	**RJH-PIN 20W/230/C/XE/G9**	20	235	14	43	20	01.09.2023
1	22319460	**RJH-PIN 33W/230/C/XE/G9**	35	460	14	43	20	01.09.2023
1	22319463	**RJH-PIN 48W/230/C/XE/G9**	50	740	14	43	20	01.09.2023
2	22319464	**RJH-PIN 60W/230/C/XE/G9**	60	980	14	51	20	01.09.2023

Further technical information from page 16.

Double ended Halogen Lamps

Product features:
- Perfect colour rendering
- Unrestricted dimming
- Innovative pinching technology
- Operation in enclosed luminaires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MADE IN GERMANY.

RJH-TSK Halogen R7s

				W	lm	d (mm)	l (mm)	pcs.	from
	R7s	G	230 1500h any						
1	22315970		**RJH-TS 48W/230/C/XE/R7S**	48	700	12	74.9	20	-
1	22315971		**RJH-TS 80W/230/C/XE/R7S**	80	1385	12	74.9	20	-
1	22315972		**RJH-TSK 120W/230/C/XE/R7S**	120	2245	12	74.9	20	-
2	22315973		**RJH-TS 120W/230/C/XE/R7S**	120	2245	12	114.2	20	-

RJH-TS Halogen R7s

				W	lm	d (mm)	l (mm)	pcs.	from
	R7s	G	230 2000h p15						
3	22315974		**RJH-TS 750W/230/C/R7S**	785	15500	12	185.7	12	-
3	22315975		**RJH-TS 1000W/230/C/R7S**	1010	21000	12	185.7	12	-
3	22315977		**RJH-TS 1500W/230/C/R7S**	1590	33000	12	250.7	12	-
3	22315978		**RJH-TS 2000W/230/C/R7S**	2050	43000	12	327.4	12	-
	R7s	G	240 2000h p15						
3	22315976		**RJH-TS 1000W/240/C/R7S**	1025	21000	12	185.7	12	-

RJL-TS Halogen R7s

				W	lm	d (mm)	l (mm)	pcs.	from
	R7s	G	42 2000h any						
2	22317413		**RJL-TS 400W/42/C/R7S***	400	9000	12	114.2	12	01.09.2021

*Note: Phase out. Packaging with old Energylabel. Further Informationen at p.80.

Low Voltage Lamps with Omni-directional Radiation.

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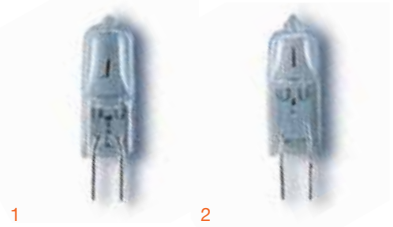
2

PIN Skylight IRC

						W	lm	d (mm)	l (mm)	pcs.	from
	G4	G	B50	V	IRC						
1	22319461		**RJL 14W/12/SKY/IRC/G4**			15	220	10	33	40	01.09.2023
	GY6.35	G	B50	V	IRC						
2	22319448		**RJL 35W/12/SKY/IRC/GY6.35**			37	800	12	44	40	01.09.2023
2	22319449		**RJL 50W/12/SKY/IRC/GY6.35**			50	1050	12	44	40	01.09.2023
2	22319450		**RJL 60W/12/SKY/IRC/GY6.35**			60	1560	12	44	40	01.09.2023

Pin Base Lamps

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



1 2

PIN Skylight

			W	lm	d (mm)	l (mm)	pcs.	from
	G4 / G / 2000h / 6							
1	22311198	**RJL 10W/6/SKY/G4**	10	110	10	33	40	01.09.2023
	G4 / G / 2000h / 12							
1	22320004	**RJL 10W/12/SKY/G4**	10	130	10	33	40	01.09.2023
1	22320005	**RJL 20W/12/SKY/G4**	20	300	10	33	40	01.09.2023
	GY6.35 / G / 2000h / 12							
2	22320006	**RJL 20W/12/SKY/GY6.35**	20	300	12	44	40	01.09.2023
2	22320007	**RJL 35W/12/SKY/GY6.35**	35	580	12	44	40	01.09.2023
2	22320008	**RJL 50W/12/SKY/GY6.35**	50	910	12	44	40	01.09.2023
2	22320009	**RJL 90W/12/SKY/GY6.35**	90	1800	12	44	40	01.09.2023

Further technical information from page 16.

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

1

2

HTM Transformer

			W	V Out	Hz Out	l (mm)	w (mm)	h (mm)	pcs.
	V	°C Ta	IP						
	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

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

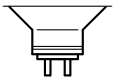
Sheet 7004-72-3

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

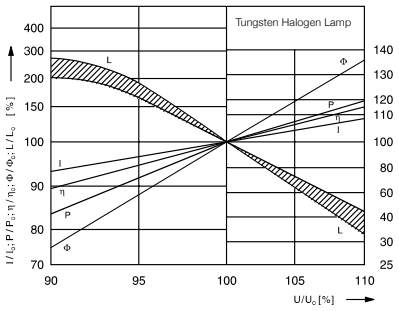
IRC Technology in low voltage halogen lamps

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.

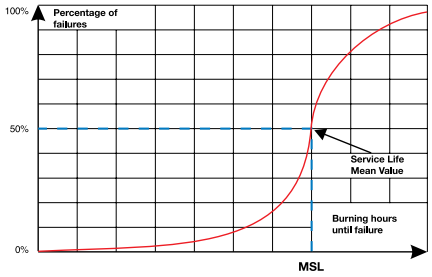
The illustrations opposite show the relative dependence of life and luminance on the mains voltage.



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 luminaries. Skylight lamps (in low pressure technology) reach max. 2.5 bar, only, and so they are allowed for open fixtures.

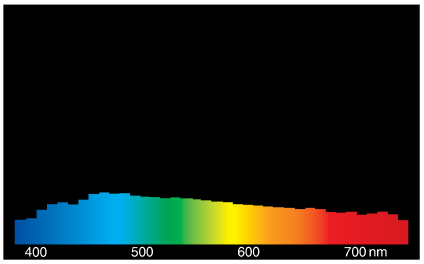
Burning position

Information regarding burning positions can be found on page 60.

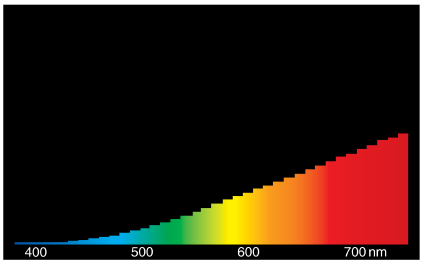
Dimming behaviour

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, lamps are being replaced by LED lighting solutions in some areas of application, and EU directives will increasingly ensure this in the future. Currently, the RoHS (Restriction of Hazardous Substances) specifies the phase-out dates for fluorescent lamps - despite the versatile applicability, the exemption will not be extended.

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 or in the LED Strips catalogue.

Compact Fluorescent Lamps
(Page 20–23)

Fluorescent Lamps
(Page 24–30)

Technical Information
(Page 31–37)

Notes on Naming Lamps (Codes for Lamp Types)

RX-D / E 18 W / 840 / G24D

- **RX-D**
  - Lamp shape, form
    - RX = Ralux
    - S = one tube
    - D = Duo
    - TW = Twin
    - T = Trio
    - L = one tube, long
    - LT = L for 5 °C
- **E** = for ECG
- **18 W** = Power, Wattage (W)
- **840**
  - Color rendering and light colour:
    - 830 = Warm white
    - 840 = Neutral white
    - 865 = Cool white (daylight)
- **G24D** = Lamp Base

NL-T5 40 W / 840C / 2GX13

- **NL-T5**
  - Lamp shape, form:
    - NL = tubular fluorescent lamp
    - T5 = 16 mm diameter
    - T8 = 26 mm diameter
    - T9 = 29 mm diameter
- **40 W** = Power, Wattage (W)
- **840C**
  - Colour rendering and light colour:
    - 830 = Warm white
    - 840 = Neutral hite
    - 865 = Cool white (daylight)
  - Further Specification:
    - C = circular (Ring)
- **2GX13** = Lamp Base

Compact Fluorescent Lamps.

1

Ralux

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G23	G	CCG	B50	CRI							
						10000h	≥ 80							
1	31316720	**RX-S 7W/840/G23**	7.1	400	56	4000	○	2.6	175	2.1	27	137	10	25.02.2023
1	31320222	**RX-S 7W/830/G23**	7.1	400	56	3000	●	2.6	175	2.1	27	137	10	25.02.2023
1	31316722	**RX-S 9W/840/G23**	9.1	600	66	4000	○	2.8	170	2.0	27	167	10	25.02.2023
1	31319823	**RX-S 9W/830/G23**	9.1	600	66	3000	●	2.8	170	2.0	27	167	10	25.02.2023
1	31316801	**RX-S 11W/840/G23**	12.4	900	73	4000	○	2.7	155	1.7	27	237	10	25.02.2023
1	31319824	**RX-S 11W/830/G23**	12.4	900	73	3000	●	2.7	155	1.7	27	237	10	25.02.2023

Compact Lamps Ralux/E, Ralux Twin and Ralux Long

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

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2

3

Ralux/E

				W	lm	lm/W	K		cd/cm²	mA	µF		d (mm)	l (mm)	pcs.	from
				2G7	G		20000h	≥ 80								
1	31310027	**RX-S/E 7W/840/2G7**		7.3	400	55	4000	○	2.6	175	-		27	114	10	25.02.2023
1	31310029	**RX-S/E 9W/840/2G7**		8.7	600	69	4000	○	2.8	170	-		27	144	10	25.02.2023
1	31310031	**RX-S/E 11W/840/2G7**		12.2	900	74	4000	○	2.7	150	-		27	214	10	25.02.2023

Ralux Twin

				W	lm	lm/W	K		cd/cm²	mA	µF		d (mm)	l (mm)	pcs.	from
				2G10	G		10000h	≥ 80								
2	31313061	**RX-TW 24W/840/2G10**		24	1700	71	4000	○	2.5	300	3.6		79	170	10	25.02.2023
2	31313062	**RX-TW 24W/830/2G10**		24	1700	71	3000	◐	2.5	300	3.6		79	170	10	25.02.2023
2	31313055	**RX-TW 36W/840/2G10**		36	2800	78	4000	○	3.0	360	4.4		79	221	10	25.02.2023
2	31313056	**RX-TW 36W/830/2G10**		36	2800	78	3000	◐	3.0	360	4.4		79	221	10	25.02.2023

Ralux Long

				W	lm	lm/W	K		cd/cm²	mA	µF		d (mm)	l (mm)	pcs.	from
				2G11	G		20000h	≥ 80								
3	31320384	**RX-L 18W/840/2G11**		18.9	1175	62	4000	○	2.1	320	-		38	221	10	25.02.2023
3	31320383	**RX-L 18W/830/2G11**		18.9	1175	62	3000	◐	2.1	320	-		38	221	10	25.02.2023
3	31320386	**RX-L 24W/840/2G11**		24	1800	68	4000	○	2.1	300	-		38	321	10	25.02.2023
3	31320385	**RX-L 24W/830/2G11**		24	1800	68	3000	◐	2.1	300	-		38	321	10	25.02.2023
3	31320388	**RX-L 36W/840/2G11**		36	2600	72	4000	○	2.8	360	-		38	415	10	25.02.2023
3	31320387	**RX-L 36W/830/2G11**		36	2600	72	3000	◐	2.8	360	-		38	415	10	25.02.2023
3	31320390	**RX-L 55W/840/2G11**		55	4320	79	4000	○	3.2	550	-		38	538	10	25.02.2023
3	31320389	**RX-L 55W/830/2G11**		55	4320	79	3000	◐	3.2	550	-		38	538	10	25.02.2023

Further technical information from page 31.

Compact Lamps Ralux Duo and Duo/E

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

1

2

Ralux Duo

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G24d	G		10000h	≥ 80							
1	31317922	**RX-D 10W/840/G24D**	10.7	600	56	4000	○	4.0	190	2.2	27	110	10	25.02.2023
1	31319825	**RX-D 10W/830/G24D**	10.7	600	56	3000	○	4.0	190	2.2	27	110	10	25.02.2023
1	31317923	**RX-D 13W/840/G24D**	13.9	870	64	4000	○	4.0	175	1.8	27	138	10	25.02.2023
1	31319826	**RX-D 13W/830/G24D**	13.9	870	64	3000	○	4.0	175	1.8	27	138	10	25.02.2023
1	31317924	**RX-D 18W/840/G24D**	18.8	1200	64	4000	○	4.5	220	2.2	27	154	10	25.02.2023
1	31319827	**RX-D 18W/830/G24D**	18.8	1200	64	3000	○	4.5	220	2.2	27	154	10	25.02.2023
1	31314613	**RX-D 26W/865/G24D**	27.3	1600	59	6500	○	5.5	325	3.2	27	172	10	25.02.2023
1	31317925	**RX-D 26W/840/G24D**	26.9	1750	65	4000	○	5.5	325	3.2	27	172	10	25.02.2023
1	31319822	**RX-D 26W/830/G24D**	26.9	1750	65	3000	○	5.5	325	3.2	27	172	10	25.02.2023

Ralux Duo/E

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G24q	G		20000h	≥ 80							
2	31313058	**RX-D/E 10W/840/G24Q**	10.7	600	56	4000	○	4.0	190	-	27	103	10	25.02.2023
2	31313059	**RX-D/E 13W/840/G24Q**	13.7	870	64	4000	○	4.0	165	-	27	131	10	25.02.2023
2	31313073	**RX-D/E 13W/830/G24Q**	13.7	870	64	3000	○	4.0	165	-	27	131	10	25.02.2023
2	31313057	**RX-D/E 18W/840/G24Q**	18.7	1200	64	4000	○	4.5	210	-	27	146	10	25.02.2023
2	31313069	**RX-D/E 18W/830/G24Q**	18.7	1200	64	3000	○	4.5	210	-	27	146	10	25.02.2023
2	31313060	**RX-D/E 26W/840/G24Q**	26.9	1750	65	4000	○	5.5	300	-	27	165	10	25.02.2023
2	31313070	**RX-D/E 26W/830/G24Q**	26.9	1750	65	3000	○	5.5	300	-	27	165	10	25.02.2023

Compact Lamps Ralux Trio and Trio/E

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

1

2

Ralux Trio

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			GX24d	G		10000h	≥ 80							
1	31313063	**RX-T 18W/840/GX24D**	19.0	1200	63	4000	○	4.7	225	2.3	49	124	10	25.02.2023
1	31313064	**RX-T 26W/840/GX24D**	27.9	1800	65	4000	○	6.0	325	3.3	49	139	10	25.02.2023

Ralux Trio/E

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			GX24q	G		20000h	≥ 80							
2	31313065	**RX-T/E 18W/840/GX24Q**	19.0	1200	63	4000	○	4.7	220	-	49	117	10	25.02.2023
2	31313066	**RX-T/E 18W/830/GX24Q**	19.0	1200	63	3000	◐	4.7	220	-	49	117	10	25.02.2023
2	31313067	**RX-T/E 26W/840/GX24Q**	27.1	1750	65	4000	○	6.0	325	-	49	132	10	25.02.2023
2	31313068	**RX-T/E 26W/830/GX24Q**	27.1	1750	65	3000	◐	6.0	325	-	49	132	10	25.02.2023
2	31313071	**RX-T/E 32W/840/GX24Q**	31.7	2250	71	4000	○	6.5	320	-	49	148	10	25.02.2023
2	31313072	**RX-T/E 32W/830/GX24Q**	31.7	2250	71	3000	◐	6.5	320	-	49	148	10	25.02.2023
2	31313074	**RX-T/E 42W/840/GX24Q**	43.4	3050	70	4000	○	7.0	320	-	49	169	10	25.02.2023
2	31313076	**RX-T/E 42W/830/GX24Q**	43.4	3050	70	3000	◐	7.0	320	-	49	169	10	25.02.2023

Further technical information from page 31.

Fluorescent Lamps.

1

T5 Standard

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G5	G		10000h		≥ 60						
1	31119592	**NL-T5 4W/640/G5**	4.6	140	30	4000	○	0.85	170	2	16	136	25	25.02.2023
1	31119593	**NL-T5 6W/640/G5**	6.5	270	42	4300	○	0.95	160	2	16	212	25	25.02.2023
1	31119594	**NL-T5 8W/640/G5**	7.5	385	51	4300	○	0.95	145	2	16	288	25	25.02.2023
1	31119596	**NL-T5 13W/640/G5**	13.2	830	63	4300	○	0.95	165	2	16	517	25	25.02.2023

Fluorescent Lamps T5 and T8 Special

Product features:
- Reliable technology
- Many fields of application
- Cost-efficient maintenance

1

2

T5 Spectralux

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G5	G		10000h	≥ 80							
1	31119595	**NL-T5 8W/840/G5**	7.5	420	56	4000	○	0.9	145	2	16	288	25	25.08.2023
1	31111983	**NL-T5 8W/827/G5**	7.5	420	56	2700	○	0.9	145	2	16	288	25	25.08.2023
1	31111984	**NL-T5 13W/827/G5**	13.2	950	72	2700	○	0.8	165	2	16	517	25	25.08.2023

T8 Spectralux Plus 1m

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G13	G		20000h	≥ 80							
2	31119590	**NL-T8 36W/840-1/G13**	38.9	3100	80	4000	○	1.3	556	6	26	970	25	25.08.2023

Further technical information from page 31.

Fluorescent Lamps T5 HE

Product features:
- Reliable technology
- Many fields of application
- Cost-efficient maintenance

1

T5 HE - Bonalux

			W	lm @25°C	lm @35°C	lm/W	K		cd/cm²	mA	d (mm)	l (mm)	pcs.	from
			G5	F		24000h	≥ 80							
1	31119591	**NL-T5 14W/865/G5**	13.9	1100	1300	93	6500		1.7	165	16	549	20	25.08.2023
1	31119597	**NL-T5 14W/840/G5**	13.9	1200	1350	97	4000		1.7	165	16	549	20	25.08.2023
1	31119598	**NL-T5 14W/830/G5**	13.9	1200	1350	97	3000		1.7	165	16	549	20	25.08.2023
1	31119599	**NL-T5 21W/865/G5**	20.7	1750	1925	93	6500		1.7	165	16	849	20	25.08.2023
1	31119604	**NL-T5 21W/840/G5**	20.7	1900	2000	97	4000		1.7	165	16	849	20	25.08.2023
1	31119605	**NL-T5 21W/830/G5**	20.7	1900	2000	97	3000		1.7	165	16	849	20	25.08.2023
1	31119578	**NL-T5 28W/865/G5**	28.3	2400	2700	95	6500		1.7	170	16	1149	20	25.08.2023
1	31119579	**NL-T5 28W/840/G5**	28.3	2600	2800	99	4000		1.7	170	16	1149	20	25.08.2023
1	31119580	**NL-T5 28W/830/G5**	28.3	2600	2800	99	3000		1.7	170	16	1149	20	25.08.2023
1	31119581	**NL-T5 35W/865/G5**	35.0	3050	3400	97	6500		1.7	175	16	1449	20	25.08.2023
1	31119582	**NL-T5 35W/840/G5**	35.0	3320	3550	101	4000		1.7	175	16	1449	20	25.08.2023
1	31119583	**NL-T5 35W/830/G5**	35.0	3320	3550	101	3000		1.7	175	16	1449	20	25.08.2023

Fluorescent Lamps T5 HO

Product features:
- Reliable technology
- Many fields of application
- Cost-efficient maintenance

1

T5 HO - Bonalux Super

				G5	G	ECG	B50	CRI	W	lm @25°C	lm @35°C	lm/W	K		cd/cm²	mA	d (mm)	l (mm)	pcs.	from
							24000h	≥ 80												
1	31119606	**NL-T5 24W/840/G5**							22.4	1750	2000	89	4000	○	2.5	295	16	549	20	25.08.2023
1	31120023	**NL-T5 24W/830/G5**							22.4	1750	2000	89	3000	◐	2.5	295	16	549	20	25.08.2023
1	31120024	**NL-T5 39W/840/G5**							37.9	3100	3400	90	4000	○	2.8	325	16	849	20	25.08.2023
1	31120025	**NL-T5 39W/830/G5**							37.9	3100	3400	90	3000	◐	2.8	325	16	849	20	25.08.2023
1	31119584	**NL-T5 54W/865/G5**							53.9	4100	4750	88	6500	●	2.9	455	16	1149	20	25.08.2023
1	31119587	**NL-T5 80W/865/G5**							80.4	5700	6650	83	6500	●	3.2	530	16	1449	20	25.08.2023
1	31119588	**NL-T5 80W/840/G5**							80.4	6150	7000	88	4000	○	3.2	530	16	1449	20	25.08.2023
1	31119589	**NL-T5 80W/830/G5**							80.4	6150	7000	88	3000	◐	3.2	530	16	1449	20	25.08.2023

				G5	F	ECG	B50	CRI	W	lm @25°C	lm @35°C	lm/W	K		cd/cm²	mA	d (mm)	l (mm)	pcs.	from
							24000h	≥ 80												
1	31119577	**NL-T5 49W/840/G5**							49.5	4310	4800	97	4000	○	2.3	255	16	1449	20	25.08.2023
1	31119576	**NL-T5 49W/830/G5**							49.5	4310	4800	97	3000	◐	2.3	255	16	1449	20	25.08.2023
1	31119585	**NL-T5 54W/840/G5**							53.9	4450	5000	93	4000	○	2.9	455	16	1149	20	25.08.2023
1	31119586	**NL-T5 54W/830/G5**							53.9	4450	5000	93	3000	◐	2.9	455	16	1149	20	25.08.2023

Further technical information from page 31.

Fluorescent Lamps T8

Product features:
- Reliable technology
- Many fields of application
- Cost-efficient maintenance

1

T8 Spectralux Plus

			W	lm	lm/W	K		cd/cm²	mA	µF	d (mm)	l (mm)	pcs.	from
			G13	G	CCG	ECG	B50	CRI										
							20000h*	≥ 80										
1	31513102	**NL-T8 15W/840/G13**	14.9	950	64	4000	○	1.0	310	4.5	26	438	25	25.08.2023
1	31120022	**NL-T8 18W/865/G13**	19.1	1250	65	6500	●	1.0	370	4.5	26	590	25	25.08.2023
1	31119477	**NL-T8 18W/840/G13**	18.8	1300	69	4000	○	1.0	370	4.5	26	590	25	25.08.2023
1	31119465	**NL-T8 18W/830/G13**	18.8	1300	69	3000	●	1.0	370	4.5	26	590	25	25.08.2023
1	31511165	**NL-T8 30W/865/G13**	31.2	2350	75	6500	●	1.2	370	4.5	26	895	25	25.08.2023
1	31513077	**NL-T8 30W/840/G13**	31.2	2400	77	4000	○	1.2	365	4.5	26	895	25	25.08.2023
1	31519422	**NL-T8 30W/830/G13**	31.2	2400	77	3000	●	1.2	365	4.5	26	895	25	25.08.2023
1	31120021	**NL-T8 36W/865/G13**	39.4	3150	80	6500	●	1.2	430	4.5	26	1200	25	25.08.2023
1	31119466	**NL-T8 36W/840/G13**	39.4	3250	82	4000	○	1.2	430	4.5	26	1200	25	25.08.2023
1	31119467	**NL-T8 36W/830/G13**	39.4	3250	82	3000	●	1.2	430	4.5	26	1200	25	25.08.2023
1	31119575	**NL-T8 38W/840/G13**	39.9	3300	83	4000	○	1.3	430	4.5	26	1047	25	25.08.2023
1	31510605	**NL-T8 38W/830/G13**	39.9	3300	83	3000	●	1.3	430	4.5	26	1047	25	25.08.2023
1	31120020	**NL-T8 58W/865/G13**	61.8	4900	79	6500	●	1.5	670	7.0	26	1500	25	25.08.2023
1	31119468	**NL-T8 58W/840/G13**	61.8	5200	84	4000	○	1.5	670	7.0	26	1500	25	25.08.2023
1	31119469	**NL-T8 58W/830/G13**	61.8	5200	84	3000	●	1.5	670	7.0	26	1500	25	25.08.2023

* 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

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2

T5 Bonalux Ring

				W	lm @25°C	lm/W	K		cd/cm²	mA	d (mm)	l (mm)	pcs.	from
			2GX13	G		12000h	≥ 80							
1	31219610	**NL-T5 22W/840C/2GX13**		23.8	1800	76	4000	○	1.7	300	16	225	12	25.02.2023
1	31219611	**NL-T5 40W/840C/2GX13**		42.0	3300	79	4000	○	2.1	320	16	300	12	25.02.2023
1	31219613	**NL-T5 55W/840C/2GX13**		55.4	4250	77	4000	○	2.6	550	16	300	12	25.02.2023

T9 Spectralux Ring

				W	lm @25°C	lm/W	K		cd/cm²	mA	d (mm)	l (mm)	pcs.	from
			G10q	G	CCG	ECG	7500h*	≥ 80						
2	31219607	**NL-T9 22W/840C/G10Q**		22.9	1230	55	4000	○	-	400	29	216	12	25.02.2025
2	31219608	**NL-T9 32W/840C/G10Q**		34.1	2100	62	4000	○	-	450	29	305	12	25.02.2025
2	31219609	**NL-T9 40W/840C/G10Q**		41.6	2900	70	4000	○	-	420	29	406	12	25.02.2025

* 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 31.

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. 31)

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Safety Starter

			W		d (mm)	l (mm)	pcs.
		°C Ta -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

			W		d (mm)	l (mm)	pcs.
		°C Ta -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 to + 80°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.

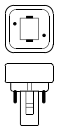
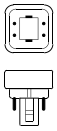
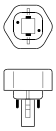
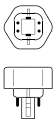
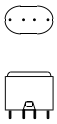
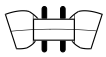
Safety starters RS 71 and RS 72

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

	CCG		ECG	
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

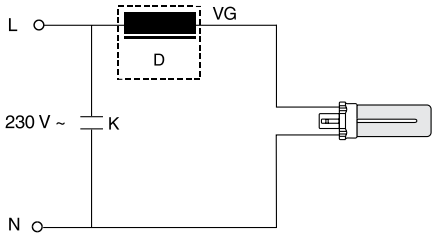
Explanation of abbreviations/legend

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

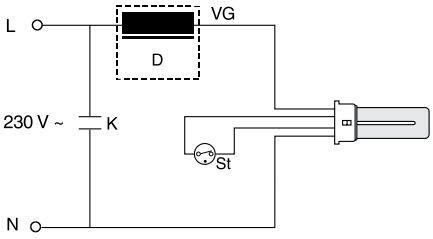
Notes on Burning Position

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

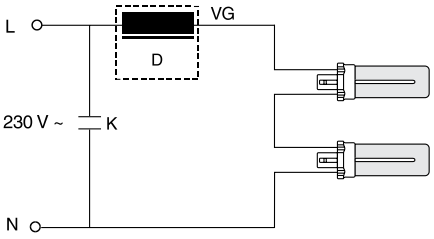
Circuit Examples for Compact Fluorescent Lamps



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



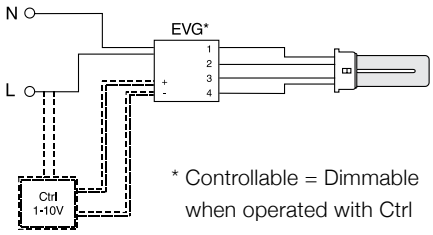
One lamp circuit with ECG for Ralux/E (Starter RS 11, 71)



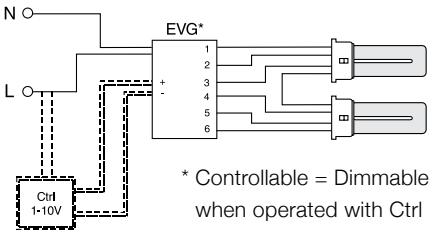
Series connection with ECG for Ralux/E (Starter integrated)

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

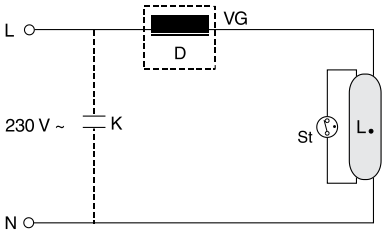


One lamp circuit with ECG for Ralux/E

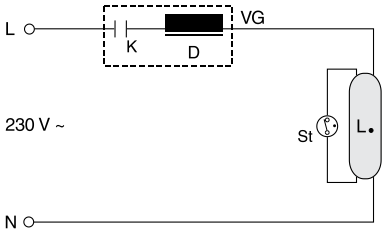


Series connection with ECG for Ralux/E

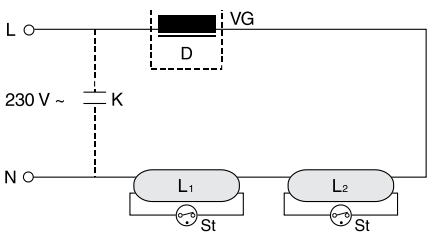
Circuit Examples for Fluorescent Lamps



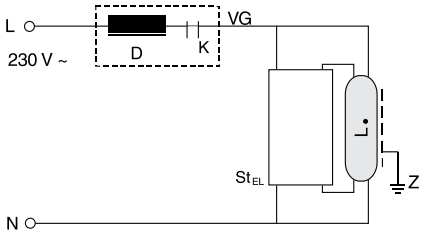
Inductive one lamp circuit with CCG/LLCG (starters RS11, RS71)



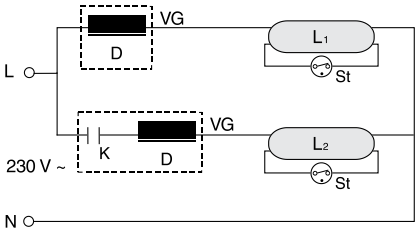
Capacitive one lamp circuit with CCG/LLCG (starters RS11, RS71)



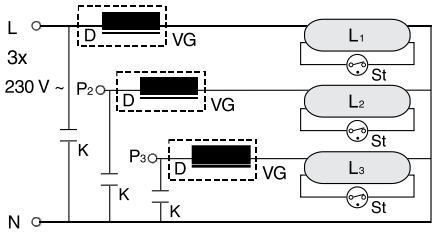
Series connection (Starters RS 51, 72)



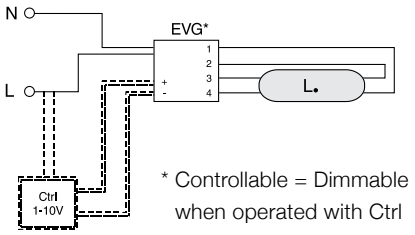
One lamp circuit with CCG/LLCG (electronic starter)



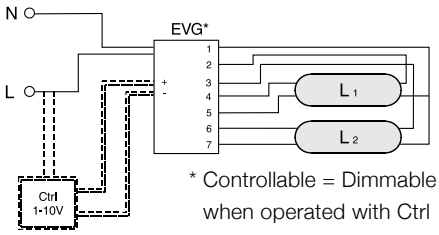
Lead-lag circuit (inductive and capacitive; starters RS 11, 71)



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 ± 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 φ expresses the effective power of a circuit, i.e. target is cos φ ≈ 1. With the choke coil(s) in the ballast the result is cos φ ≈ 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 φ ≈ 1. In order to get the power factor cos φ ≈ 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 (± 2%) and ballasts (± 1.5%) must be used. Circuits with ECG normally reach cos φ ≈ 1.

Dimming Behaviour

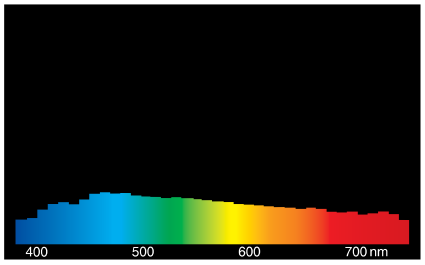
Compact fluorescent lamps and fluorescent lamps can be dimmed by suitable electronic ballasts only. Commercially available energy-saving lamps (compact fluorescent lamps with integral ballast and standard base) are not dimmable.

Colour rendering and colour temperature

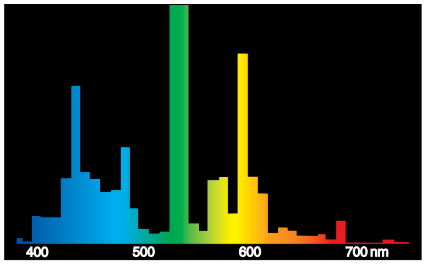
COLOUR	CRI	K	COLOUR OLD	
880	80-89	8000	–	Skylux
865	80-89	6500	11	cool daylight
840	80-89	4000	21	white
640	60-69	4000	20	coolwhite
830	80-89	3000	31	warmwhite
827	80-89	2700	41	intra

Spectral distribution of radiation

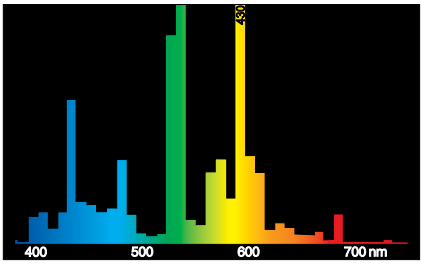
Fluorescent Lamps and Compact Fluorescent Lamps
As the daylight is a mixture of direct sun light and sky light, its spectral composition changes continuously depending on the time of day and weather. The normal D65 type of light corresponds to a type of day light with a colour temperature of approx. 6500 K.



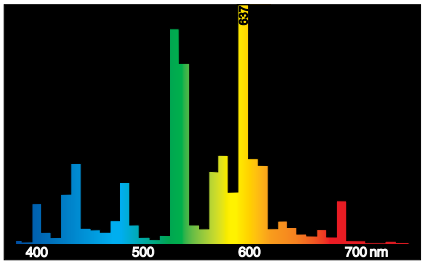
Daylight (D 65)



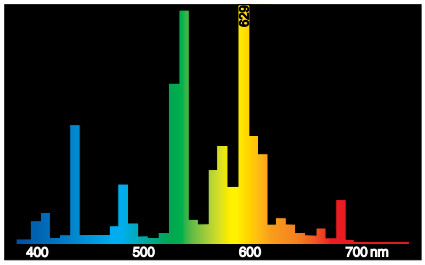
Light colour 865 Spectralux® daylight



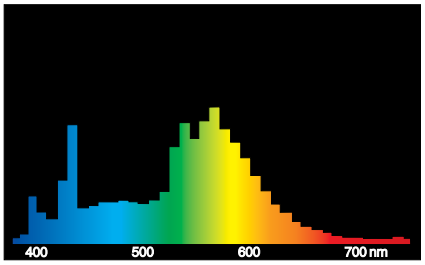
Light colour 840 Spectralux® white



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.

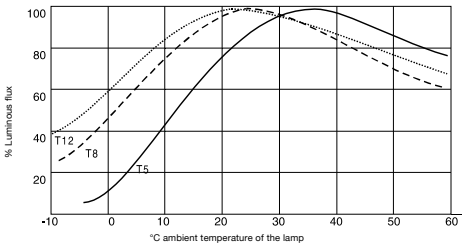
Reliance on temperature

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

		T8 Spectralux®	T5 HE Bonalux®	T5 HO 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

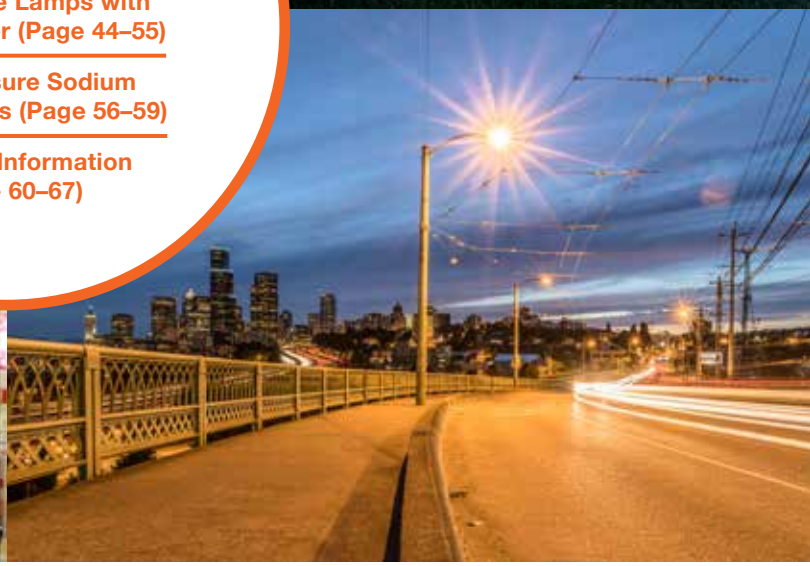
The Bright Ones.
High Pressure Discharge Lamps.

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 but are still considered an exception for RoHS (see fluorescent lamps).

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.



Notes on Naming Lamps (Codes for Lamp Types)

RCC-TC **35 W** / **WDL** / **230** / **G8.5**

- **RCC-TC** — Lamp shape, form:
  - RCC = Metal Halide Lamps with Ceramic Burner
  - T = tubular shape
  - TC = T compact
  - TS = T double ended
  - E = ellipsoidal bulb
  - /P = protected, for open fixtures
- **35 W** — Power, Wattage (W)
- **WDL** — Light colour:
  - WDL = Warm white
  - NDL = Neutral white
  - D = Cool white (daylight)
  - 930 = WDL
- **230** — Nominal Voltage (V)
- **G8.5** — Lamp Base

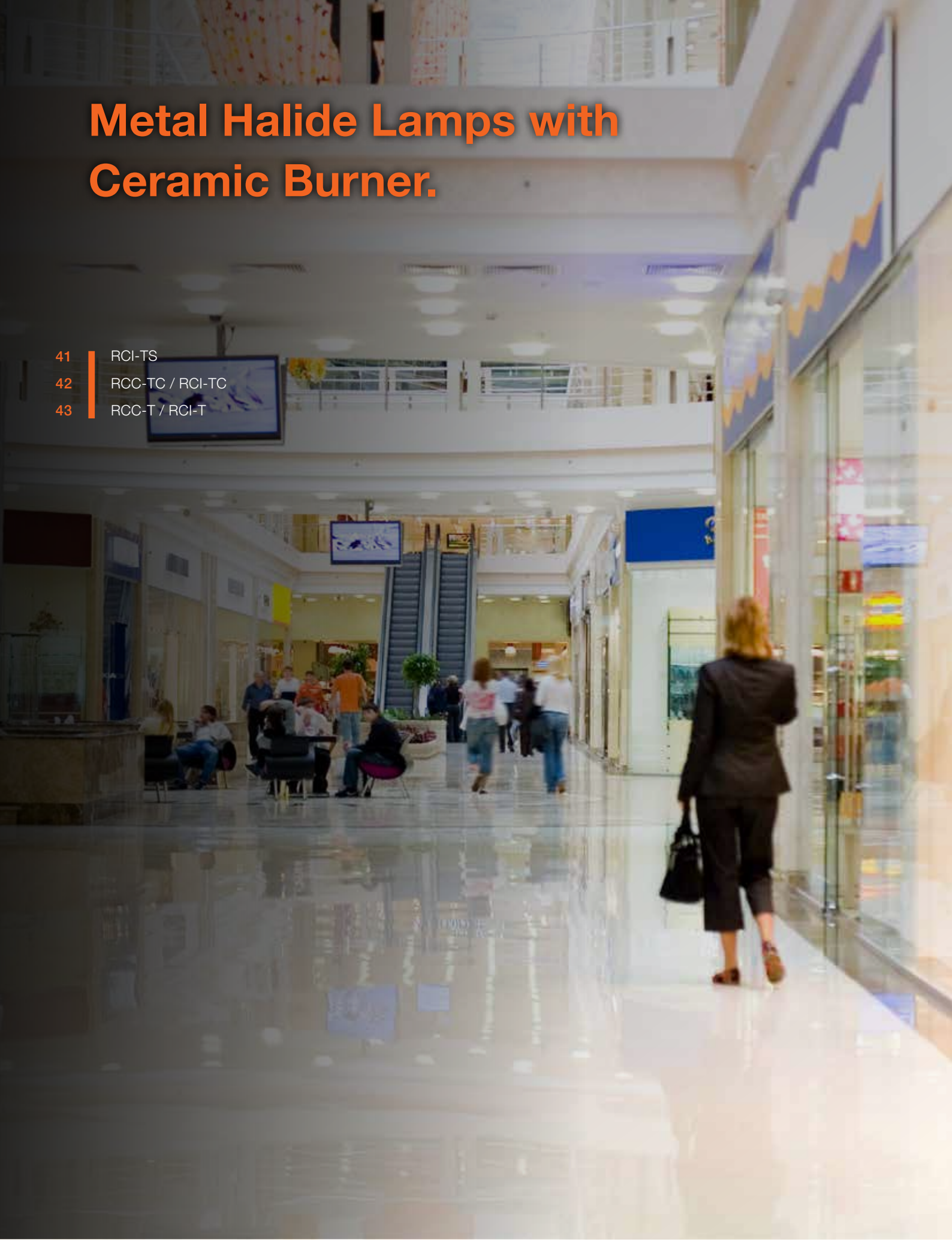
HRI-TS **2000 W** / **D** / **S** / **PRO** / **400** / **K12S**

- **HRI-TS** — Lamp shape, form:
  - HRI = Metal Halide Lamps with Quartz Burner
  - T = tubular shape
  - TS = T double ended
  - E = ellipsoidal bulb
- **2000 W** — Power, Wattage (W)
- **D** — light colour:
  - WDL = Warm white
  - N, NSC, NDL = Neutral white
  - D = Cool white (daylight)
  - B = blue
- **S** — Further Specification:
  - XLN = Excellence
  - S = Shortarc
  - L = Longarc
  - PRO = Professional
  - ECG = for ECG
  - I = with internal igniter
  - HF = High Flux
- **400** — Nominal Voltage (V)
- **K12S** — Lamp Base

RNP-E / **LR** / **400 W** / **S** / **230** / **E40**

- **RNP-E** / **LR** — Lamp shape, form:
  - RNP = High Pressure Sodium Vapour Lamps
  - T = tubular shape
  - TS = T double ended
  - E = ellipsoidal bulb
  - /LR = Long Run (4Y)
  - /XLR = Extra-Long Run (6Y)
- **400 W** — Power, Wattage (W)
- **S** — Further Specification:
  - S = Super
  - I = with internal igniter
- **230** — Nominal Voltage (V)
- **E40** — Lamp Base

Metal Halide Lamps with Ceramic Burner.



Ceramic Burner Lamps

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

1

2

RCI-TS

					W	lm	lm/W	K		CRI	d (mm)	l (mm)	mm	pcs.
					RX7S	G	16000h	220-240						
1	32419474	**RCI-TS 70W/WDL/230/RX7S**			72	6200	86	3000	●	≥ 80	21	118	114.2	12
1	32419473	**RCI-TS 70W/NDL/230/RX7S**			73	6500	88	4200	○	≥ 80	21	118	114.2	12
2	32420042	**RCI-TS 150W/WDL/230/RX7S**			144	14500	100	3000	●	≥ 80	27	135	132.0	12
2	32419475	**RCI-TS 150W/NDL/230/RX7S**			141	13700	97	4200	○	≥ 80	27	135	132.0	12

Operation in enclosed luminaires

Technical Specifications for Operation

			W	A	A	µF	kVs	kVs	
32419474	**RCI-TS 70W/WDL/230/RX7S**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	36	p45
32419473	**RCI-TS 70W/NDL/230/RX7S**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	36	p45
32420042	**RCI-TS 150W/WDL/230/RX7S**	CCG + ECG	155	1.8	1.8	20	3.6 to 5.0	36	p45
32419475	**RCI-TS 150W/NDL/230/RX7S**	CCG + ECG	164	1.8	1.8	20	3.6 to 5.0	36	p45

Further technical information from page 60.

Ceramic Burner Lamps

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

1

RCC-TC / RCI-TC

									d (mm)	l (mm)	pcs.
			G8.5	G	B50 15000h	V 220-240					
1	32419682	**RCI-TC 20W/WDL/230/G8.5**	20	1600	80	3000	○	≥ 80	15	85	12
1	32419679	**RCI-TC 35W/NDL/230/G8.5**	41	3400	85	4200	○	≥ 80	15	85	12
1	32419678	**RCC-TC 35W/WDL/230/G8.5**	39	4100	95	3000	○	≥ 80	15	85	12
1	32419681	**RCI-TC 70W/NDL/230/G8.5**	73	6400	88	4200	○	≥ 80	15	85	12
1	32419680	**RCC-TC 70W/WDL/230/G8.5**	73	7900	108	3000	○	≥ 80	15	85	12

Operation in enclosed luminaires

Technical Specifications for Operation

32419682	**RCI-TC 20W/WDL/230/G8.5**	ECG	-	0.2	-	-	-	h180
32419679	**RCI-TC 35W/NDL/230/G8.5**	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32419678	**RCC-TC 35W/WDL/230/G8.5**	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32419681	**RCI-TC 70W/NDL/230/G8.5**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180
32419680	**RCC-TC 70W/WDL/230/G8.5**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180

1

RCC-T / RCI-T

				W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
		G12	F	15000h	220-240							
1	32419471	**RCC-T 35W/WDL/230/G12**		39	4100	105	3000	○	≥ 80	15	90	12
1	32419641	**RCI-T 35W/NDL/230/G12**		41	3500	85	4200	○	≥ 80	15	90	12
1	32419972	**RCC-T 70W/WDL/230/G12**		73	8000	109	3000	○	≥ 80	19	90	12
1	32419642	**RCI-T 70W/NDL/230/G12**		73	6500	89	4200	○	≥ 80	19	90	12
1	32420041	**RCI-T 150W/WDL/230/G12**		146	15000	103	3000	○	≥ 80	20	100	12
1	32419643	**RCI-T 150W/NDL/230/G12**		149	12300	83	4200	○	≥ 80	20	100	12

Operation in enclosed luminaires

Technical Specifications for Operation

				W	A	A	µF	kVs	
32419471	**RCC-T 35W/WDL/230/G12**	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32419641	**RCI-T 35W/NDL/230/G12**	CCG + ECG	45	0.5	0.5	6	3.6 to 5.0	h180
32419972	**RCC-T 70W/WDL/230/G12**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180
32419642	**RCI-T 70W/NDL/230/G12**	CCG + ECG	84	1.0	1.0	12	3.6 to 5.0	h180
32420041	**RCI-T 150W/WDL/230/G12**	CCG + ECG	166	1.8	1.8	20	3.6 to 5.0	h180
32419643	**RCI-T 150W/NDL/230/G12**	CCG + ECG	166	1.8	1.8	20	4.0 to 5.0	h180

Further technical information from page 60.

Metal Halide Lamps with Quartz Burner.

1

MADE IN GERMANY.

HRI-TS E40

					W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
			E40	4000h	400								
1	32416569	**HRI-TS 2000W/D/400/E40**	-		2000	180000	90	6000		93	100	495	4

Technical Specifications for Operation

			W	A	A	µF	kVs	kVs	
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	B50	V							
					12000h	220-240							
1	32419662	**HRI-TS 70W/NDL/230/XLN/RX7S**	G	82.3	6100	74	4200	○	78	20	117	114.2	12
1	32419663	**HRI-TS 70W/WDL/230/XLN/RX7S**	G	81.2	5925	83	3300	○	67	20	117	114.2	12
1	32419664	**HRI-TS 150W/D/230/XLN/RX7S**	G	156.6	13000	83	5450	○	81	23	135	132.0	12
1	32419661	**HRI-TS 150W/NDL/230/XLN/RX7S**	G	156.8	12500	80	4200	○	80	23	135	132.0	12
1	32419665	**HRI-TS 150W/WDL/230/XLN/RX7S**	G	154.7	12000	78	3000	○	70	23	135	132.0	12

Technical Specifications for Operation

32419662	**HRI-TS 70W/NDL/230/XLN/RX7S**	CCG + ECG	90	1.0	1.0	12	4.0 to 5.0	35	p45
32419663	**HRI-TS 70W/WDL/230/XLN/RX7S**	CCG + ECG	90	1.0	1.0	12	4.0 to 5.0	35	p45
32419664	**HRI-TS 150W/D/230/XLN/RX7S**	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	35	p45
32419661	**HRI-TS 150W/NDL/230/XLN/RX7S**	CCG + ECG	170	1.8	1.8	20	4.0 to 5.0	35	p45
32419665	**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 60.

1

HRI-TS Fc2

										d (mm)	l (mm)	pcs.
			Fc2	12000h	220-240							
1	32418888	**HRI-TS 250W/D/PRO/230/FC2***	G	250	21500	86	5500		93	26	162	12
1	32418889	**HRI-TS 250W/NDL/230/FC2***	G	250	20000	80	4200		88	26	162	12
1	32418890	**HRI-TS 250W/WDL/230/FC2***	G	250	22000	88	3200		80	26	162	12
1	32418891	**HRI-TS 400W/D/PRO/230/FC2***	G	400	35000	83	5500		93	33	206	12
1	32418892	**HRI-TS 400W/NDL/230/FC2***	G	400	36000	88	4200		85	33	206	12

*Phase out. Successors still to be determinded.

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

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3

HRI-T E40

											d (mm)	l (mm)	pcs.
				E40	16000h	230							
1	32419666	**HRI-T 250W/D/PRO/230/E40***	G	260	18000	76	5500	●	92	46	226	12
2	32419667	**HRI-BT 400W/D/PRO/230/E40***	G	430	34000	80	5500	●	92	62	290	12
MIG. 3	32416565	**HRI-T 1000W/D/230/E40**	-	1000	85000	85	7250	●	81	76	345	6

*Phase out. Successors still to be determinded.

				E40	5500h	230							
MIG. 1	32417735	**HRI-T 400/NSC/S/230/E40**	G	444	40300	89	3600	○	62	46	273	12
MIG. 3	32416659	**HRI-T 1000W/NSC/230/E40**	-	1000	110000	105	3500	○	64	82	345	6

Technical Specifications for Operation

32419666	**HRI-T 250W/D/PRO/230/E40**	CCG	280	3.0	3.0	32	4.0 to 5.0	h180
32419667	**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
32417735	**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

Further technical information from page 60.

1

2

HRI-T E40

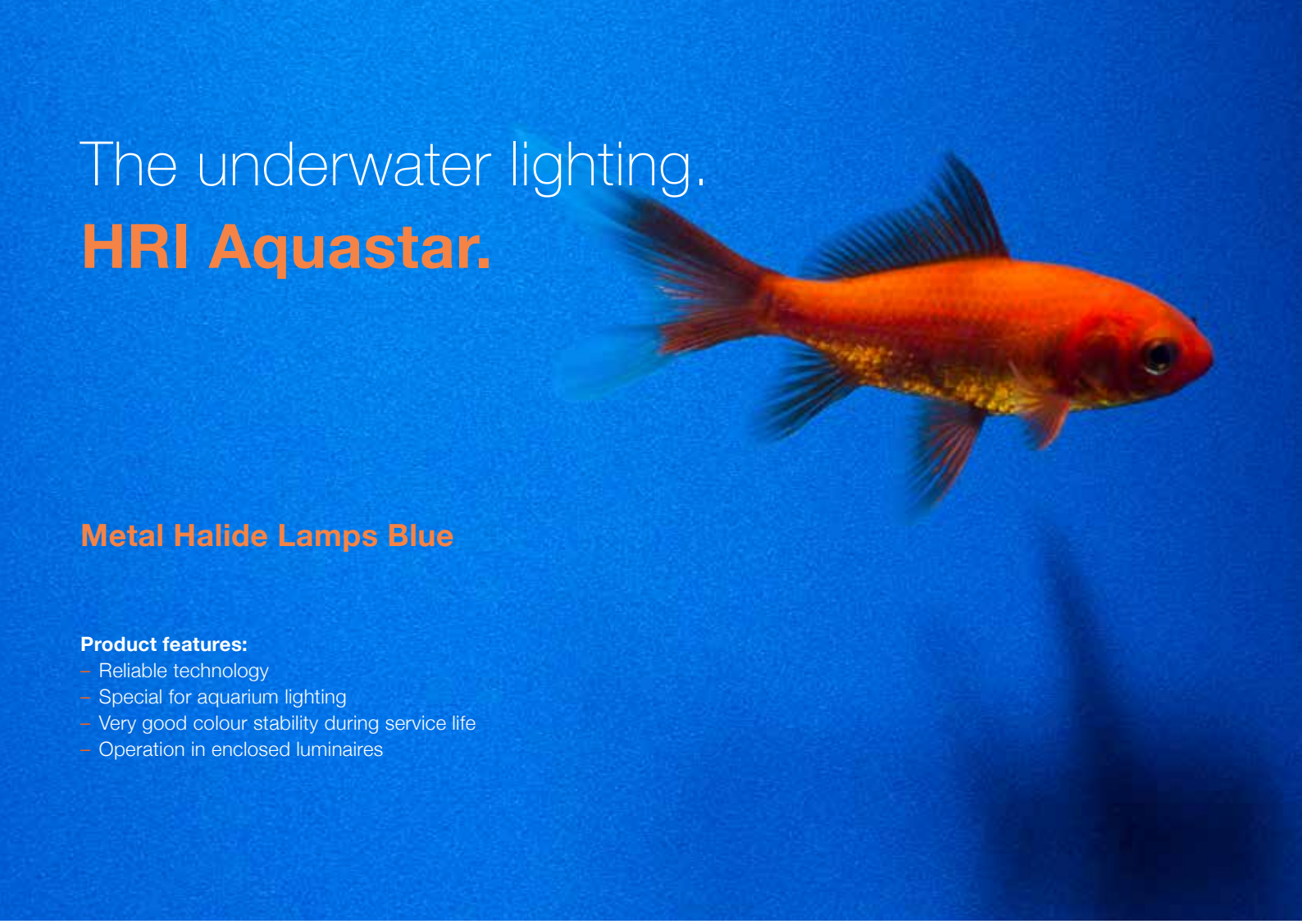
					W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
					E40	12000h	400						
MIG.	1	32416653	**HRI-T 2000W/D/400/E40**	-	2050	180000	86	7250	●	80	106	430	4
MIG.	2	32416652	**HRI-T 2000W/D/I/400/E40**	-	2050	180000	85	7250	●	83	106	430	4
MIG.	2	32416650	**HRI-T 2000W/N/I/400/E40**	-	2000	205000	102	4300	○	60	106	430	4
					E40	5500h	400						
MIG.	1	32416651	**HRI-T 2000W/NSC/400/E40**	-	2000	245000	124	4500	○	63	106	430	4

Technische Daten Betrieb

32416653	**HRI-T 2000W/D/400/E40**	CCG	2150	10.2	10,3	60	4.0 bis 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 bis 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

MADE IN GERMANY.

HRI-T Aquastar blue

				W	lm	K		CRI	d (mm)	l (mm)	h	pcs.
			E40	230								
1	32416552	**HRI-T 250W/230/B/E40**	-	270	7500	20000	○	-	46	210	4000	12
1	32416555	**HRI-T 400W/230/B/E40**	-	360	8700	20000	○	-	46	273	7500	12

Technical Specifications for Operation

			W	A	A	µF	kVs	
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 60.

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

E40 | 16000h | 230

				W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
1	32419669	**HRI-E 250W/D/PRO/230/E40**	G	250	18000	73	5200	○	92	90	226	12
1	32419668	**HRI-E 400W/D/PRO/230/E40**	G	430	34000	81	5200	○	92	121	290	12

*Phase out. Successors still to be determinded.

Technical Specifications for Operation

			W	A	A	µF	kVs	
32419669	**HRI-E 250W/D/PRO/230/E40**	CCG	280	3.0	3.0	32	4.0 to 5.0	h180
32419668	**HRI-E 400W/D/PRO/230/E40**	CCG	450	4.0	4.6	45	4.0 to 5.0	h180

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2

HRI-E E40 NSC

				W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
			E40 12000h 230									
1	32417734	**HRI-E 400/NSC/S/230/C/E40**	F	440	42000	95	4000	○	62	120	290	12
1	32416601	**HRI-E 1000W/NSC/230/C/E40**	-	1000	110000	110	3900	○	65	165	380	6
			E40 9000h 230									
2	32417733	**HRI-E 400/NSC/S/230/F/E40**	F	444	42000	91	3800	○	62	120	290	12
2	32416584	**HRI-E 1000W/NSC/230/F/E40**	-	1050	100000	94	3700	○	62	165	380	6

Technical Specifications for Operation

				W	A	A	µF	kVs	
32417734	**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
32417733	**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 60.

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HRI-TS K12s ECG Shortarc

			W	lm	lm/W	K		CRI	d (mm)	l (mm)	pcs.
	K12s-36	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

MADE IN GERMANY.

HRI-TS K12s Shortarc

			W	lm	lm/W	K		CRI	B50	h	d (mm)	l (mm)	pcs.
			K12s-36	230									
1	32416676	**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

32416676	**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 60.

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3

MADE IN GERMANY.

HRI-TS K12s Shortarc

			W	lm	lm/W	K		CRI	B50 h	d (mm)	l (mm)	pcs.
	K12s-36	-	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	32418580	**HRI-TS 2000W/NDL/S/400/K12S**	2000	222000	115	4400	○	90	6000	36	187	10

HRI-TS K12s DP Shortarc

			W	lm	lm/W	K		CRI	B50 h	d (mm)	l (mm)	pcs.
	-	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
32418580	**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

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HRI-TS K12s Longarc

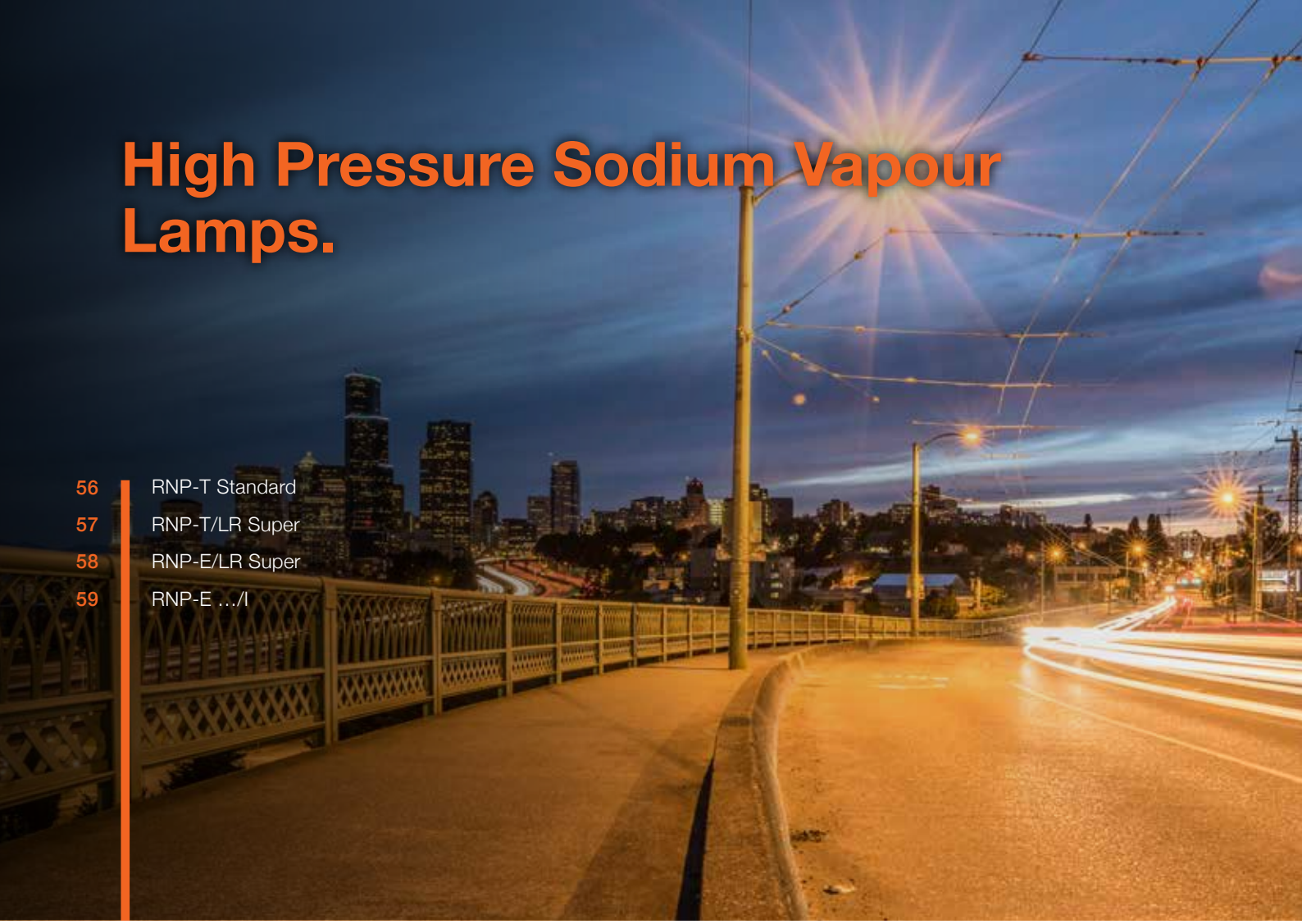
			W	lm	lm/W	K		CRI	B50	h	d (mm)	l (mm)	pcs.
	K12s-36	-	400										
1	32416582	**HRI-TS 2000W/N/L/400/K12S**	2150	230000	107	4100	○	65	8000	32	274	10

Technical Specifications for Operation

			W	A	A	µF	kVs	kVs	
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 60.

High Pressure Sodium Vapour Lamps.



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RNP-T Standard

					W	lm	lm/W	B50 h	B5 h	d (mm)	l (mm)	pcs.
			E40	2000	25	230										
1	34404708	**RNP-T 1000W/230/E40**		-	960	130000	135	20000	8000	66	360	12

Technical Specifications for Operation

			W	A	A	µF	kVs	
34404708	**RNP-T 1000W/230/E40**	CCG	1030	10.6	10.3	100	4.0 to 5.0	h180

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RNP-T/LR Super

			EL G→A	W	lm	lm/W	B50	B5			
							h	h	d (mm)	l (mm)	pcs.
			K	CRI	V						
			E27	2000	25	230					
1	34414854	**RNP-T/LR 50W/S/230/E27**	G	56.0	4200	81	28000	16000	36	156	12
1	34416043	**RNP-T/LR 70W/S/230/E27**	F	76.9	6400	90	30000	16000	36	156	12
			K	CRI	V						
			E40	2000	25	230					
1	34414713	**RNP-T/LR 100W/S/230/E40**	F	105.2	10300	103	36000	20000	47	210	12
1	34414715	**RNP-T/LR 150W/S/230/E40**	F	161.1	17500	115	36000	20000	47	210	12
1	34414853	**RNP-T/LR 250W/S/230/E40**	E	267.4	33200	125	36000	20000	47	257	12
1	34414856	**RNP-T/LR 400W/S/230/E40**	E	415.5	56500	137	36000	20000	47	285	12
1	34411907	**RNP-T/LR 600W/S/230/E40**	-	615.8	90000	146	32000	20000	47	285	12

Technical Specifications for Operation

			W	A	A	µF	kVs	
34414854	**RNP-T/LR 50W/S/230/E27**	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34416043	**RNP-T/LR 70W/S/230/E27**	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34414713	**RNP-T/LR 100W/S/230/E40**	CCG + ECG	114	1.2	1.2	12	3.3 to 5.0	h180
34414715	**RNP-T/LR 150W/S/230/E40**	CCG + ECG	170	1.8	1.8	20	3.3 to 5.0	h180
34414853	**RNP-T/LR 250W/S/230/E40**	CCG + ECG	280	3.0	3.0	32	3.3 to 5.0	h180
34414856	**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

Further technical information from page 60.

Sodium Lamps with Elliptical Bulb

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RNP-E/LR Super

				W	lm	lm/W	B50 h	B5 h	d (mm)	l (mm)	pcs.
			E27 / 2000 / 25 / 230								
1	34419709	**RNP-E/LR 50W/S/230/E27**	G	54.5	4000	77	28000	16000	71	155	24
1	34419711	**RNP-E/LR 70W/S/230/E27**	G	75.4	6400	90	30000	16000	71	155	24
			E40 / 2000 / 25 / 230								
1	34414714	**RNP-E/LR 100W/S/230/E40**	F	103.6	10100	101	36000	20000	76	183	12
1	34419712	**RNP-E/LR 150W/S/230/E40**	F	160.3	17000	112	36000	24000	91	226	12
1	34419713	**RNP-E/LR 250W/S/230/E40**	E	262.7	31600	124	36000	24000	91	226	12
1	34419716	**RNP-E/LR 400W/S/230/E40**	E	418.3	56500	137	36000	24000	122	290	12

Technical Specifications for Operation

			W	A	A	µF	kVs	
34419709	**RNP-E/LR 50W/S/230/E27**	CCG + ECG	62	0.8	0.8	10	1.8 to 5.0	h180
34419711	**RNP-E/LR 70W/S/230/E27**	CCG + ECG	82	1.0	1.0	12	1.8 to 5.0	h180
34414714	**RNP-E/LR 100W/S/230/E40**	CCG + ECG	114	1.2	1.2	12	3.3 to 5.0	h180
34419712	**RNP-E/LR 150W/S/230/E40**	CCG + ECG	170	1.8	1.8	20	3.3 to 5.0	h180
34419713	**RNP-E/LR 250W/S/230/E40**	CCG + ECG	280	3.0	3.0	32	3.3 to 5.0	h180
34419716	**RNP-E/LR 400W/S/230/E40**	CCG + ECG	451	4.4	4.6	45	3.3 to 5.0	h180

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RNP-E .../I

					W	lm	lm/W	B50 h	B5 h	d (mm)	l (mm)	pcs.
			E27	2000	25	230						
1	34419708	**RNP-E 50W/I/230/E27**	G	53.6	3700	72	24000	9000	71	156	24
1	34414712	**RNP-E 70W/I/230/E27**	G	74.6	5900	84	24000	12000	71	156	24

Technical Specifications for Operation

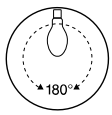
			W	A	A	µF	kVs	
34419708	**RNP-E 50W/I/230/E27**	CCG	62	0.8	0.8	10	-	hs30
34414712	**RNP-E 70W/I/230/E27**	CCG	82	1.0	1.0	12	-	hs30

Further technical information from page 60.

Overview of Important Information.

Technical Information.

Burning positions



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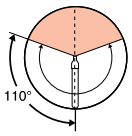

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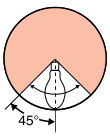

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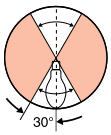
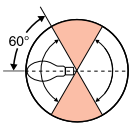
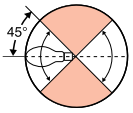


hs30



p60



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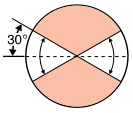

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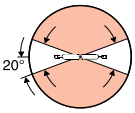

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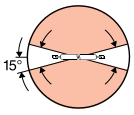

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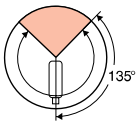
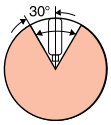
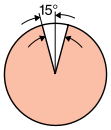


s135



s30



s15

permissible

not permissible

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.

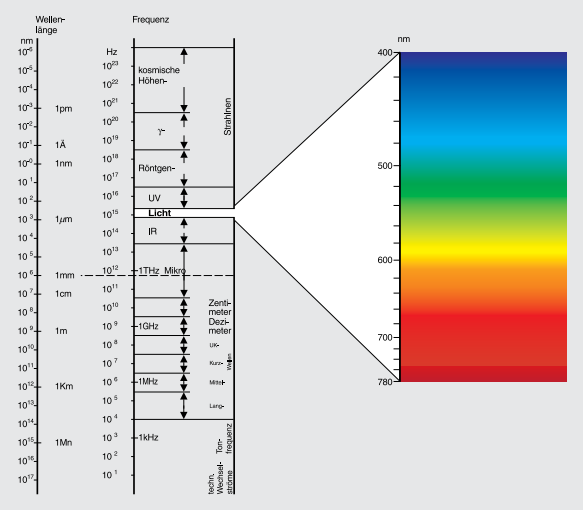
For lamps with a filament field as an area the inclination of the denoted burning position is only permissible so that branches of the filament do not lie behind one another.

What is Light?

Light and Radiation.

Electromagnetic radiation

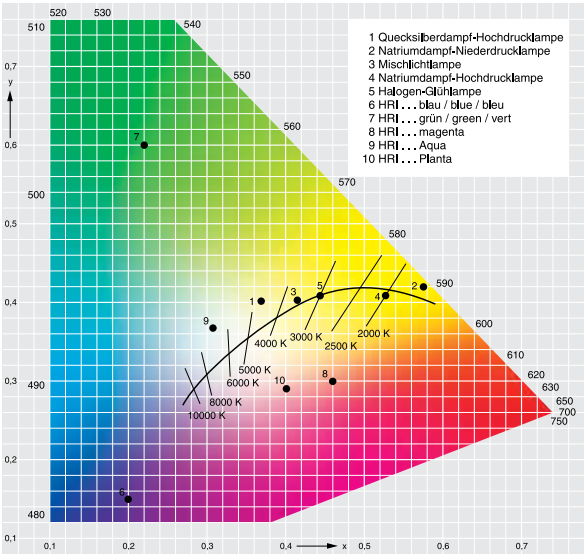
The term light refers to electromagnetic radiation provoking a sensation of brightness in the human eye, i. e. this radiation can be perceived by the eye. This refers to the radiation range between 380 and 780 nm which is only a tiny part of the spectrum of electromagnetic radiation we know.



Colour locus and colour coordinates

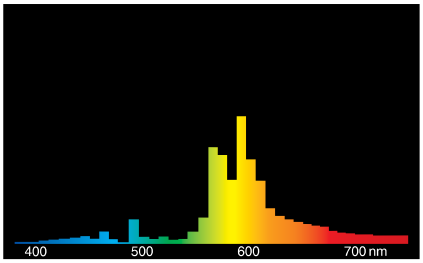
Extract from the CIE colour triangle with Planck's plot including the colour locus of the most important lamps for general illumination.

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



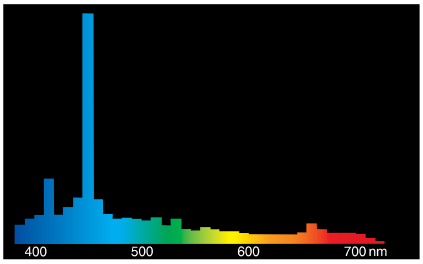
Spectral distribution of radiation

High Pressure Sodium Vapour Lamps.
Because of their high luminous efficacy and their long service life, sodium vapour lamps are considered exceptionally economical.



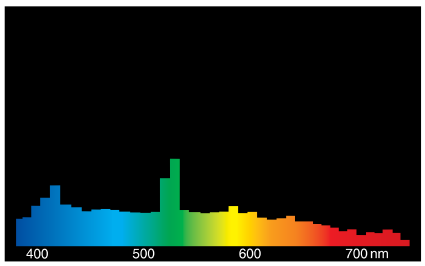
Standard/Super

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 48 and 50

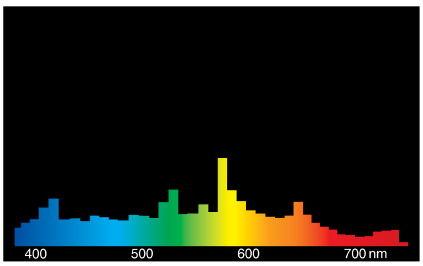


HRI … /B/Aquastar

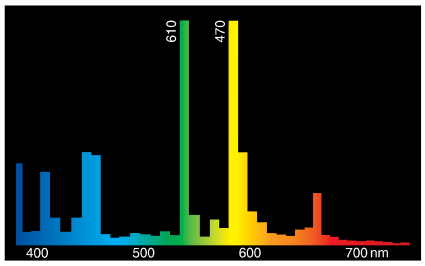
Legend:
… /WDL Warm white DE LUXE
… /D Cool white (daylight)
… /NDL Neutral white DE LUXE
… /N Neutral white
… /NSc Neutral white



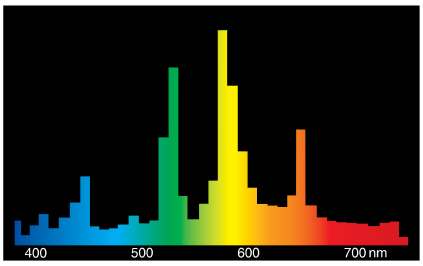
HRI … /D



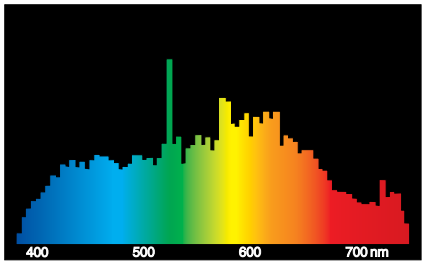
HRI … /NDL



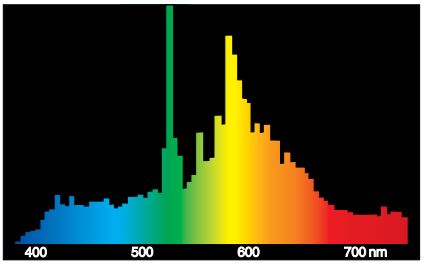
HRI … /N und HRI … /NSC



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 RCI ... /NDL	LED* … /830 LED* … /827 Ralux® … /830 Ralux® … /827 Bonalux® … /830 Spectralux® … /830 Spectralux® … /827 HRI … /WDL RCC … /WDL RCI ... /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

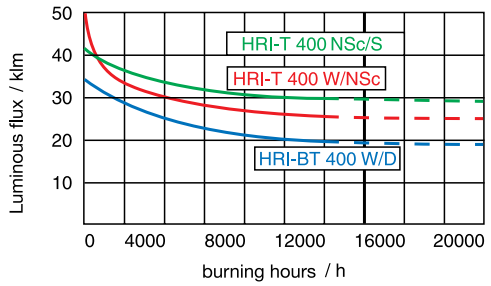
*LED-Retrofit, LED-Strips and Luminaires

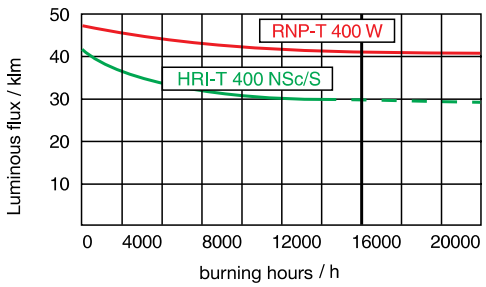
Notes on Metal Halide Lamps

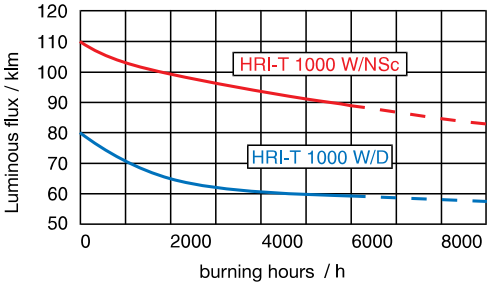
Dimming Behaviour

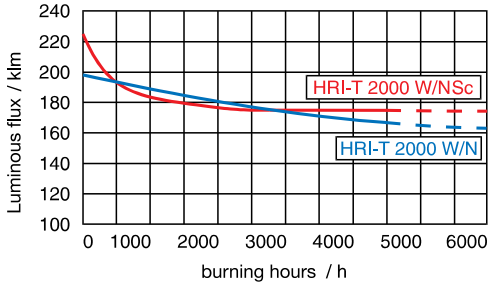
The higher thermal robustness of the round shape burner ceramics enables an improved dimming behaviour regarding luminous efficiency and colour rendering compared to metal halide lamps with quartz burner. With dimming a wandering of chromatic coordinates still happens. Lamps operated with dimming have 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









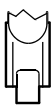
Lamp Bases (DIN-EN 60061-1)

E27

Sheet 7004-21-10

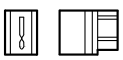
E40

Sheet 7004-24-6



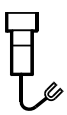
RX7s-24

Sheet 7004-92A-4



Fc2

Sheet 7004-114-1



K12s-36

Sheet 7004-168-1

G8.5

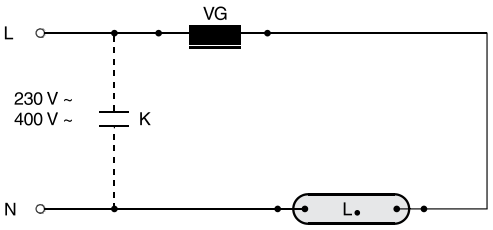
Sheet 7004-122-3

G12

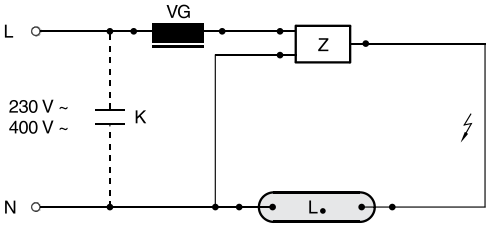
Sheet 7004-63-2

Circuit Examples

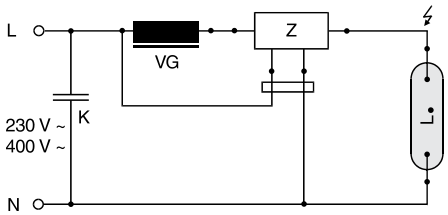
Metal Halide Lamps
High Pressure Sodium Vapour Lamps



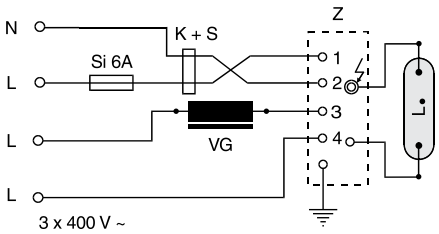
Standard circuit for all HRI, RNP with internal igniter



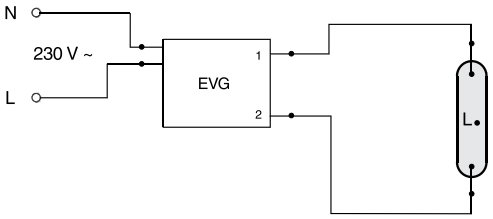
Standard circuit for all RCC,HRI, RNP for external ignition



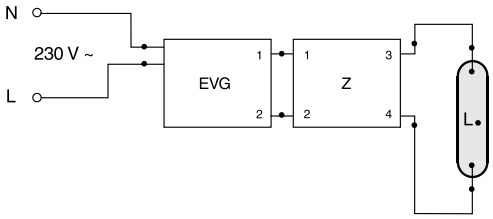
Superimposed electronic igniter ZG 3 for hot re-strike lamps



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 ≥ 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 V	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 65	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 kVs	appropriate igniter required; exception: lamps with internal igniter see table page 67 full luminous flux after approx. 1-4 min., 140% up to 190% run-up current	appropriate igniter required; exception: lamps with internal igniter see table page 67 RNP: full luminous flux after approx. 6-10 min., 125% run-up current
Reignition kVs kVs	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 (swichting off characteristics 'C'). See special instructions for the fuses of metal halide lamps.

Power factor cos φ

When operated with a ballast the capacity cos φ 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.35.

Luminous flux lm

The values of the luminous flux always refer to the quoted burning position and the nominal wattage of the lamps. They are defermined 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 impendance) 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

	V	CCG		ECG
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.../I/... [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/RCI-T 35, 70, 150W	230	yes + ZG1	no[2]	yes
RCI-TC 20W	230	no	no[2]	yes
RCC-TC/RCI-TC 35, 70W	230	yes + ZG1	no[2]	yes
RCI-TS 70, 150W	230	yes + ZG1	no[2]	yes
RNP-E 50, 70W.../I/... [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 PTo3DIM
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 400 V
ZG3: Instant igniter 230 V
ZG4: Instant igniter 400 V

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.

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

1

2

MADE IN GERMANY.

Halogen lamps for airfield lighting

				W	A	lm	d (mm)	l (mm)	mm	mm	pcs.
		R7s	p15	B50 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

1

2

3

MADE IN GERMANY.

Lamps for navigation lights, Form E

			W	V	lm	cd	d (mm)	l (mm)	mm	pcs.
			BAY15d	any	B50					
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

			W	V	lm	cd	d (mm)	l (mm)	mm	pcs.
			P28s	s30	B50					
2	26122921	**SN-T 40W/2450C/24/P28S***								
2	26122918	**SN-T 60W/1150C/110/P28S***								
3	26122922	**SN-T 65W/2250C/230/P28S***								

* coming soon

Traffic Lamps

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

1

2

3

Low voltage-traffic lamps

				W	V	lm	B50 h	B2 h	d (mm)	l (mm)	mm	pcs.
		BA20s	s135									
1	11411067	**SVA-NUE 20W/10/BA20S**		22	10	270	11000	4000	36	67	31	100

Mains voltage-traffic lamps

				W	V	lm	B50 h	B2 h	d (mm)	l (mm)	mm	pcs.
		E27	s135									
2	11411288	**SVA 40W/220-240/C/E27**		40	220-240	230	8000	3000	12	110	69	100

Mains voltage-traffic lamps with krypton

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

Further technical information from page 72.

Overview of Important Information.

Technical Information.

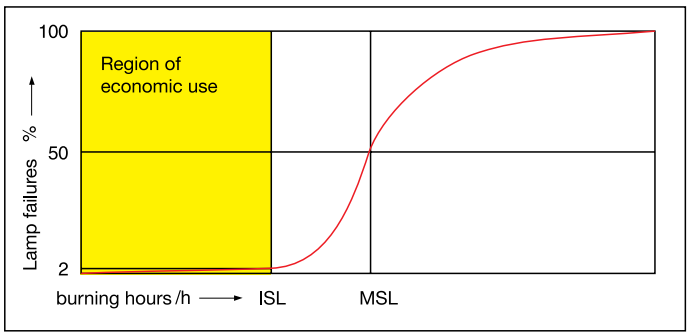
Service life for traffic light lamps

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 standarized conditions (cf. line MSL in diagram).



Non-EU Lamps without CE Marking.

1

NL Standard fluorescent lamps

														d (mm)	l (mm)	pcs.
			G13			13000h	70-79									
1	31118771	**NL-T8 18W/765/G13 EX**	G	18	1050	58	6500	○	370	4.5	26	590	25
1	31118772	**NL-T8 36W/765/G13 EX**	G	36	2500	69	6500	○	430	4.5	26	1200	25
1	31118773	**NL-T8 58W/765/G13 EX**	G	58	4000	69	6500	○	670	7.0	26	1500	25
1	31119627	**NL-T8 18W/765/G13 MAR**	G	18	1050	58	6500	○	370	4.5	26	590	25
1	31119628	**NL-T8 36W/765/G13 MAR**	G	36	2500	69	6500	○	430	4.5	26	1200	25
1	31119629	**NL-T8 58W/765/G13 MAR**	G	58	4000	69	6500	○	670	7.0	26	1500	25

Further technical information from page 31.

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

				W	lm	lm/W	B50 h	B5 h	d (mm)	l (mm)	pcs.
			E40	2000	25	230					
1	34416635	**RNP-T 150W/230/E40 EX**	F	150	15000	100	20000	8000	47	210	12
1	34416636	**RNP-T 250W/230/E40 EX**	F	255	28000	110	20000	8000	47	257	12
1	34422204	**RNP-T 400W/230/E40 EX**	E	400	48000	112	20000	8000	47	285	12

Technical Specifications for Operation

			W	A	µF	kVs	
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 60.

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.

Other countries - other marks:
Before shipping, please find out which markings are required on the products or packaging in the destination country - and what documentation is involved.

For example, the CMIM mark for Morocco.

Overview of Important Information.
Pictograms, other Icons and Notes.

Explanation of pictograms

Power consumption (W)

Power consumption with ballast (W)

Power factor

Mains voltage (V)

Output voltage (V)

Nominal current (A)

Nominal choke current (A)

Nominal current (mA)


Series connection

Output frequency (Hz)

Compensation capacitor
(µF, 50Hz-operation)

Ignition voltage (kVs)

Hot restrike voltage (kVs)


Mode of operation, ballast

Suitable for electronic ballast
(ECG, HF-operation)

Suitable for conventional ballast
(CCG/LLCG, 50Hz-operation)


Light colour

Code light colour

Code light colour old

Luminous efficiency (lm/W)


Light centre (mm)

Luminous intensity (cd)

Luminous flux (lm)


Luminous flux maintenance

Colour temperature (K)

Colour rendering index R_a

Mean luminance (cd/cm2)

UV radiation reduced (UV-EX)

IIRC Technolgy (IRC = infrared reflective coating)

Beam angle (°)

Burning position

Dimmable

Base (Example here: screw base)

Spectral distribution

Lamp type

Structural shape T5 HE

Structural shape T5 HO

Structural shape T8

Structural shape Ring

Compact fluorescent lamp

Dimensions of a lamp (mm)

Dimensions of other products (mm)

Distance between electrical contacts (mm)

Temperature behaviour

Permissible range of ambient temperatures (°C)

Life in General (h)

Mean service Life (h)

95% survival rate (h)

98% survival rate (h)

Ingress protection rating

Protection class II

Information

CE Marking

EU-date of phase-out

Burning in

Energy label according to
EU-directive 2019/2015

Suitable for open fixtures

Box quantity lamps (pcs.)

Box quantity other products (pcs.)

WEEE waste bin
(= not to be disposed of via household waste, more information at www.radium.de/recycling or on p.79)

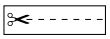
Made in Germany

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

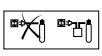
Burning positions restrictions: p = horizontal, h = hanging (base up), s = upright (base down), 45 = ± 45°

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.

Ervery 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 for light sources under the number DE 36655118 and for batteries under DE 66777526.

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).

Practial 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	www.lightcycle.de
German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety	www.bmu.de
German Central Association of Electrical Engineering and the Electrical Industry	www.zvei.org
All about light	www.licht.de
German Foundation for old electrical appliances register	www.stiftung-ear.de
German Federal Environment Agency	www.uba.de
LightingEurope	www.lightingeurope.org
Environmental forum for household appliances of Austria	www.ufh.at

The Energy Label

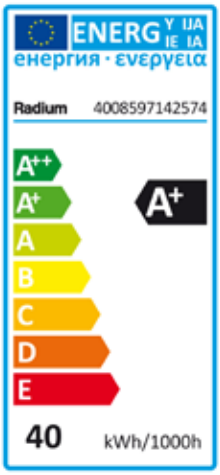
An energy consumption labelling system - energylabel or energy label - has been around for a long time for many products in the EU, so it is a well-known obligation.
The energy label is intended to be a simple guide to choosing and buying environmentally friendly, energy-saving products.

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 has also been 'reset' to classes A to G for light sources, having taken effect from Sept 1st 2021 and thus returning to its origin 1998.

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

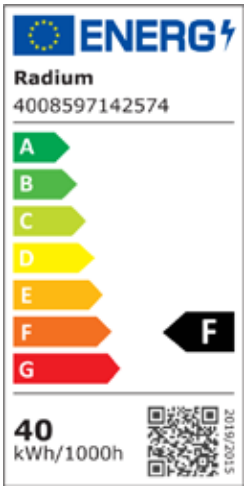
Affected Light Sources



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 and correct 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

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.

In Online shops the new energy label must be shown since September 1st 2021.

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

Place for you.

Notes.

Radium
Die Lichtmarke

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

V2205