



Discharge lamps

Small but powerful.



High-pressure discharge lamps, also known as high-intensity discharge (HID) lamps, differ from incandescent lamps in the way in which they produce light. They are very efficient because they generate extremely high luminous flux in a very small space.

For example, a 2000 W metal halide lamp, such as the ones installed in football stadium floodlights, produces as much light as two 5000 W incandescent lamps. The area in which the light is produced is no larger than a 2 euro coin. Other advantages of modern high-pressure discharge lamps include low thermal output, excellent colour rendering

and long life. What's more, because of the compact dimensions of these lamps, their light can be easily and accurately directed.

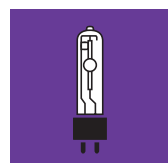
Consequently, high-pressure discharge lamps are the light sources of choice

- wherever products and objects need to be presented, such as in shop windows and retail outlets
- where bright light and long life are important, for example in factories, in stadiums and for street lighting
- and for plant lighting.



Contents

What you need to know about discharge lamps	5.02
POWERBALL® HCl®-T, HCl®-TM	5.04
POWERSTAR® HQI®-T	5.05
POWERBALL® HCl®-TC, POWERSTAR® HCl®-TC	5.06
POWERBALL® HCl®-TF	5.07
POWERBALL® HCl®-T Shoplight, POWERBALL® HCl®-TC Shoplight	5.08
POWERSTAR® HQI®-R	5.09
POWERBALL® HCl®-TS	5.10
POWERSTAR® HQI®-TS	5.11
POWERSTAR® HQI®-TS, short-arc lamps, long-arc lamp	5.12
POWERSTAR® HQI®-T, POWERSTAR® HQI®-T, without igniter	5.13
POWERBALL® HCl®-T	5.14
POWERSTAR® HQI®-T, POWERSTAR® HQI®-T, coloured	5.15
POWERBALL® HCl®-T/P	5.16
POWERBALL® HCl®-TT	5.17
POWERBALL® HCl®-E/P	5.18
POWERSTAR® HQI®-E, clear, POWERSTAR® HQI®-E, coated	5.19



POWERBALL® HCI®-E	5.20
POWERSTAR® HQI®-E, clear and coated, quartz technology	5.21
POWERBALL® HCI®-R111	5.22
POWERBALL® HCI®-PAR, POWERSTAR® HCI®-PAR	5.23
VIALOX® NAV®-E	5.24 – 5.25
VIALOX® NAV®-T, PLANTASTAR®	5.26
VIALOX® NAV®-TS	5.27
SOX	5.28
HQL®, HQL®-B, HQL®-R	5.29 – 5.30
HWL®, starters and switch elements	5.31
Typical applications	5.32
Relative spectral power distribution	5.33
Technical data	5.34 – 5.39
Operating instructions	5.40 – 5.42
System + guarantee for HCI/HQI and PTi/PTU	5.43
Circuit diagrams, light distribution of reflector lamps	5.44
Light colours and colour rendering properties, burning positions, bases	5.45

All the lamps presented in this section can be used for indoor and outdoor applications in appropriate luminaires.

More light where it is needed



The principle of high luminous efficacy.

These lamps operate on the basis of an arc discharge. There is a constant arc between two electrodes that causes the filler material to give off light. This principle can be used with different metals and filler materials. Our range includes metal halide lamps, sodium lamps and mercury vapour lamps. Almost all discharge lamps need control gear to ignite them and limit their current.

Metal halide lamps.

The addition of metals and iodides greatly improves the colour and luminous efficacy of POWERSTAR HQI® lamps. With their extremely short discharge arc, they come very close to the ideal of a point light

source, which means their light is very easy to direct exactly where it is needed, and they offer a high utilisation factor.

POWERSTAR® HCI® lamps represent a further development of POWERSTAR® HQI® metal halide lamps, the most successful metal halide lamps in the world. They are fully compatible with the corresponding HQI® lamps. Their constant colour throughout their lives, their luminous efficacy and their colour rendering are all excellent. With their round ceramic discharge vessels, patented by OSRAM, they provide even better performance than their cylindrical counterparts in terms of light, colour and stability.



New: System guarantee for OSRAM ECGs in combination with a wide range of HQL/HCI lamps (see page 5.43)

Optimum operation with electronic control gear.

The system reliability, comfort and economy of 35, 70 and 150 W HQL®/HCL® lamps are considerably improved if the lamps are operated with POWERTRONIC® ECGs.

VIALOX® NAV® high-pressure sodium lamps.

VIALOX® high-pressure sodium lamps provide the highest luminous efficacy of all high-pressure discharge lamps – as much as 150 lumens per watt.

Their principal benefits are as follows:

- Extremely high luminous efficacy
- Extremely long life

They are the most economical light sources in general lighting that enable the human eye to distinguish between colours.

OSRAM has developed the largest range of high-pressure sodium lamps. They are available in three complete VIALOX® NAV® families:

- NAV® with high reliability and economy
- NAV® 4Y® with extremely high reliability and economy

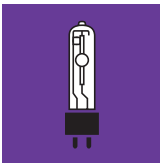
- NAV® SUPER 4Y® with outstanding luminous efficacy and extremely high reliability

NAV® 4Y®: technology that takes us into the third millennium. With the new OSRAM VIALOX® NAV® 4Y® lamps it is now possible to replace groups of high-pressure sodium lamps in street lighting every four years.

This is thanks to the most advanced technology currently available for high-pressure sodium lamps. Innovative arc tube design, high-performance ceramics, shock absorbers and the most up-to-date manufacturing processes such as laser welding are all combined to produce virtually perfect arc tubes every time. Longer maintenance intervals and a reduction in premature failures add up to considerable savings in relamping costs.

HQL® mercury vapour lamps.

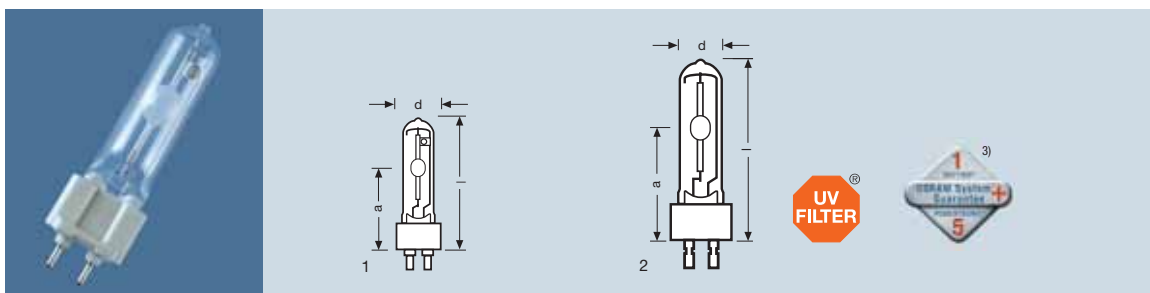
Mercury vapour lamps do not need igniters but they do need control gear. High-pressure mercury vapour lamps are used primarily for street and factory lighting.



Metal halide lamps

T tubular, G12 base, G22 base, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm						
POWERBALL® HCI®-T									
HCI-T 35/830 WDL PB	4008321005625	37	3400	G12	19	100	56	1	12
HCI-T 35/942 NDL PB	4050300873480	37	3300	G12	19	100	56	1	12
HCI-T 70/830 WDL PB	4050300873664	72	7000	G12	19	100	56	1	12
HCI-T 70/942 NDL PB	4050300873626	72	6700	G12	19	100	56	1	12
HCI-T 100/830 WDL PB ²⁾	4008321907660	100	9500	G12	19	100	56	1	12
HCI-T 100/942 NDL PB ²⁾	4008321907677	100	9300	G12	19	100	56	1	12
HCI-T 150/830 WDL PB	4050300873435	145	15500	G12	25	105	56	1	12
HCI-T 150/942 NDL PB	4050300873336	145	14500	G12	25	105	56	1	12
HCI-TM 250/830 WDL PB	4050300977263	245	26000	G22	34	175	90	2	10
HCI-TM 250/942 NDL PB ¹⁾	4008321907684	245	25000	G22	34	175	90	2	10
HCI-TM 400/942 NDL PB ²⁾	4008321907691	400	40000	G22	34	175	90	2	10

All HCI®-T lamps now feature innovative POWERBALL® technology.

POWERBALL® HCI®-T lamps are single-ended UV-reduced lamps.

Approved for use in enclosed luminaires.

Benefits of POWERBALL® technology:

- High luminous flux
- Best distribution of light
- Best colour rendering
- Longest colour constancy
- Small loss of luminous flux over lifetime
- Little dependency on burning position
- Full output available soon after switching the lamp on
- Lower failure rate due to ceramic corrosion

Benefits of UV FILTER technology

- Double the illuminance or exposure compared with standard shields
- Reduced brittleness of the plastics in luminaires
- A low-cost shatter-proof cover plate made from thermal glass can be used as a cover in the luminaire instead of a UV filter

New

- **HCI®-T 100 W** closes the gap between 70 W and 150 W
- **HCI®-TM 250 W and 400 W** are much more compact than other discharge lamps of the same output.

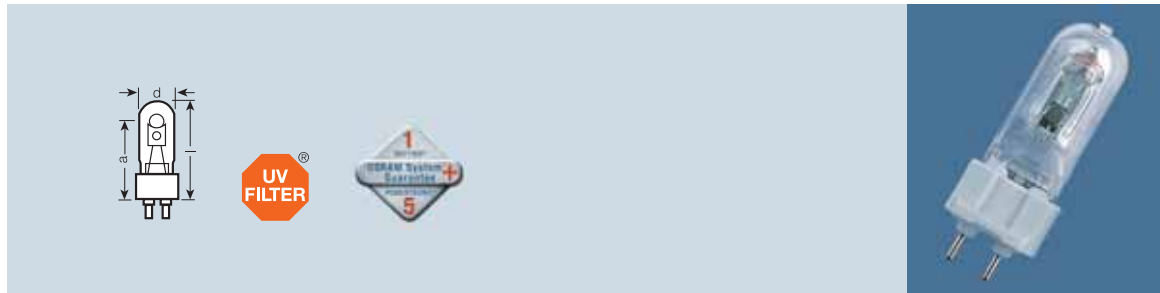
For all applications in which light is focused. G22 plug-in base for good positioning. Ideal for light guide systems and spotlight systems.

Applications

- Retail outlets and shop windows
- High-quality presentation of merchandise
- Museums, foyers and art galleries
- Exterior lighting



Metal halide lamps T tubular, clear, G12 base Quartz technology



Product reference	Product number	W	lm		d [mm]	I max. [mm]	LCL a [mm]	
POWERSTAR® HQI®-T								
HQI-T 70/WDL	4050300412993	70	5300	G12	25	84	56	12
HQI-T 70/NDL	4050300488424	70	5800	G12	25	84	56	12
HQI-T 150/WDL	4050300413013	150	13000	G12	25	84	56	12
HQI-T 150/NDL	4050300488448	150	13000	G12	25	84	56	12

POWERSTAR® HQI®-T lamps are among the shortest metal halide lamps in the world for general lighting. Single-ended and UV-reduced. Approved for use in enclosed luminaires.

They are available in Warm White DE LUXE and Neutral White DE LUXE.

Benefits

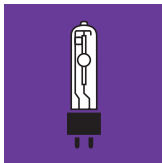
- High luminous efficacy
- Excellent colour rendering properties
- Long life
- High luminous flux
- Low thermal output
- UV FILTER technology (see 5.04)
- The Warm White DE LUXE colour combines well with the light from HALOSTAR® lamps

Applications

- **Indoors:** Factories, shop interiors, shop windows, foyers, hotels, restaurants, trade fairs, exhibitions, offices, schools and sports halls, and for high-quality yet economical architectural lighting
- **Outdoors:** Floodlighting, prestige roads, parks, building facades and monuments

Comments

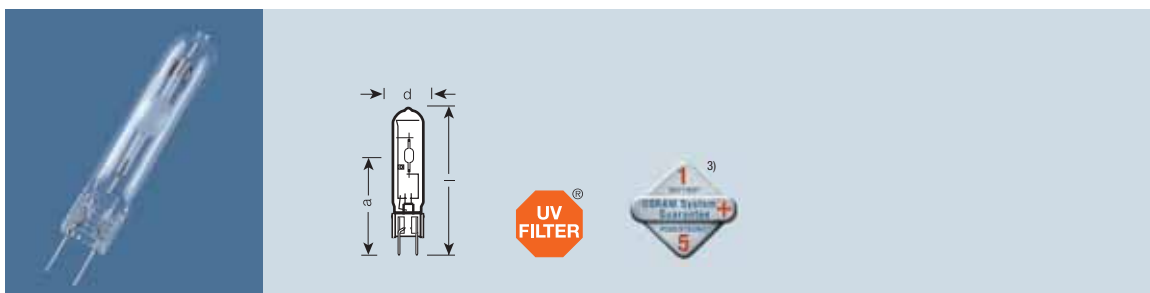
- Burning position: For the horizontal burning position, mount the holder so that the lamp electrodes are not arranged one on top of the other



Metal halide lamps

TC tubular, compact, G8.5 base, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	I max. [mm]	LCL a [mm]	
POWERBALL® HCl®-TC								
HCl-TC 20/830 WDL PB	4008321 052216	20	1700	G8.5	15	81	52	12
HCl-TC 35/830 WDL PB	4050300 873763	37	3400	G8.5	15	81	52	12
HCl-TC 35/942 NDL PB	4050300 873725	37	3200	G8.5	15	81	52	12
HCl-TC 70/830 WDL PB ¹⁾	4008321 907639	72	6900	G8.5	15	81	52	12
HCl-TC 70/942 WDL PB	in development							
POWERSTAR® HCl®-TC								
HCl-TC 70/830 WDL ²⁾	4050300 873831	72	6600	G8.5	15	81	52	12
HCl-TC 70/942 NDL ²⁾	4050300 873794	72	6300	G8.5	15	81	52	12

POWERBALL® HCl®-TC and POWERSTAR® HCl®-TC lamps are compact metal halide lamps from OSRAM. They are single-ended and have a UV-reduced outer bulb. Approved for use in enclosed luminaires.

Benefits

- Enables compact luminaires to be designed
- Small dimensions allow good focusing in the luminaires
- UV FILTER technology (see 5.04)
- POWERBALL® HCl®-TC also has all the benefits of innovative POWERBALL® technology (see 5.04) – e.g. good colour rendering, low colour spread, constant colour and high luminous flux
- New “Secure Fix” G8.5 base

Applications

- Retail premises
- Accent lighting
- Decorative lighting

New “Secure Fix” G8.5 base from OSRAM

“Secure Fix” means:

1. Mechanically stable base design for a secure fit
2. Secure fit by decoupling the electrical contacts and positioning the lamp using holders with retaining springs

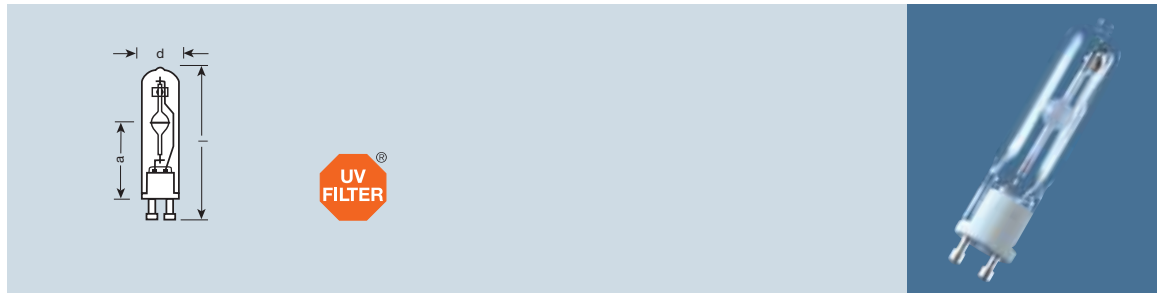
“Secure Fix” bases can be used in all G8.5 holders that comply with the usual standards.



Metal halide lamps

TF tubular, GU6.5 base, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	
POWERBALL® HCl®-TF								
HCl-TF 20/830 WDL PB ¹⁾	4008321 907615	20	1700	GU6.5	13	57	31	12
HCl-TF 35/830 WDL	in development							

New

POWERBALL® HCl®-TF are the smallest metal halide lamps from OSRAM. They are single-ended and UV-reduced.

Approved for use in enclosed luminaires.

Applications

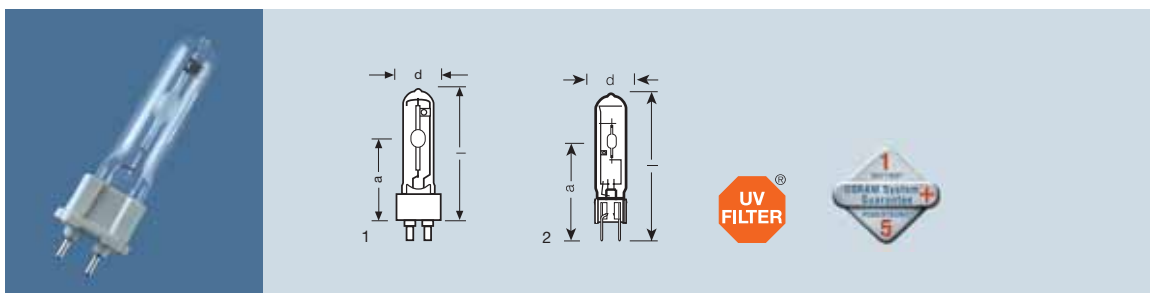
Thanks to their small dimensions, HCl®-TF lamps are used wherever halogen lamps are the first choice. Because they produce more light and are extremely efficient the same brightness levels can be achieved with fewer lamps (and less energy). High efficiency means lower thermal output.

Benefits

- Plenty of light and very small dimensions
- The new twist & lock GU6.5 base ensures stabile positioning in the luminaire
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

1) From 2007

Metal halide lamps T and TC, Shoplight tubular, G12 and G8.5 base, for enclosed luminaires POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
POWERBALL® HCl®-T Shoplight									
HCl-T 35/930 WDL PB ¹⁾	40083211 08166	39	3100	G12	19	100	56	1	12
HCl-T 70/930 WDL PB	4050300 983134	73	6400	G12	19	100	56	1	12
POWERBALL® HCl®-TC Shoplight									
HCl-TC 35/930 WDL PB ¹⁾	40083211 08142	37	3000	G8.5	15	81	52	2	12
HCl-TC 70/930 WDL PB	4050300 983110	73	6300	G8.5	15	81	52	2	12

POWERBALL® HCl®-T Shoplight and POWERBALL® HCl®-TC Shoplight are ideal for displaying fabrics and food, and wherever colour rendering and colour matching are important criteria. They are single-ended and UV-reduced.
Approved for use in enclosed luminaires.

Benefits

- Excellent colour rendering: POWERBALL® Shoplight with colour 930 WDL achieve a colour rendering index greater than 95 for the first time for a warm white colour (colour rendering group 1A)
- Much improved red rendering
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux
- New "Secure Fix" G8.5 base

Applications

- Prestige retail outlets and shop windows
- High-quality presentation of merchandise
- Museums and exhibitions

New "Secure Fix" G8.5 base from OSRAM

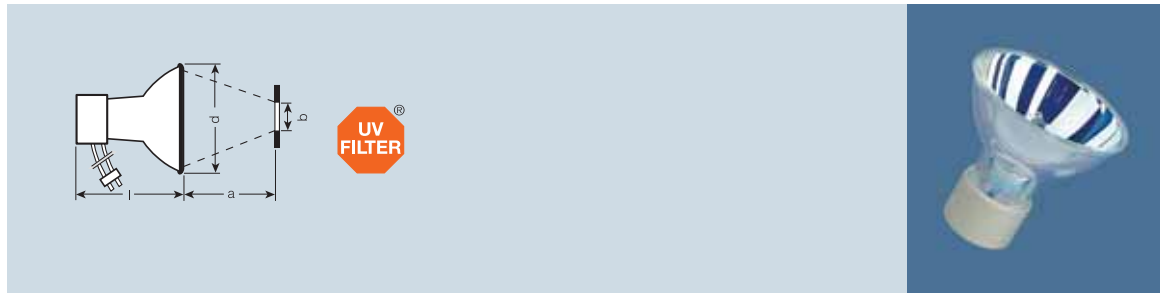
"Secure Fix" means:

1. Mechanically stable base design for a secure fit
2. Secure fit by decoupling the electrical contacts and positioning the lamp using holders with retaining springs

"Secure Fix" bases can be used in all G8.5 holders that comply with the usual standards.



Metal halide lamps R reflector, for enclosed luminaires Quartz technology



**Product
reference**

**Product
number**



POWERSTAR® HQI®-R

Reflector lamp, igniter required, for enclosed luminaires only, quartz technology

HQI-R 150/NDL/F0	4050300465722	150	11000	5200 (b = 25 mm)	Plug	95	92	75	12
				1850 (b = 10 mm)					

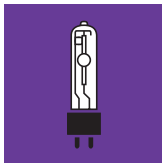
The POWERSTAR® HQI®-R lamp has a focusing dichroic reflector. Single-ended and UV-reduced. Approved for use in enclosed luminaires.

Benefits

- For compact optical systems with high efficiency in fibre-optic systems
- Optimum adjustment
- Low thermal load on the light guide
- Long life
- Quick and easy lamp replacement
- UV FILTER technology (see 5.04)



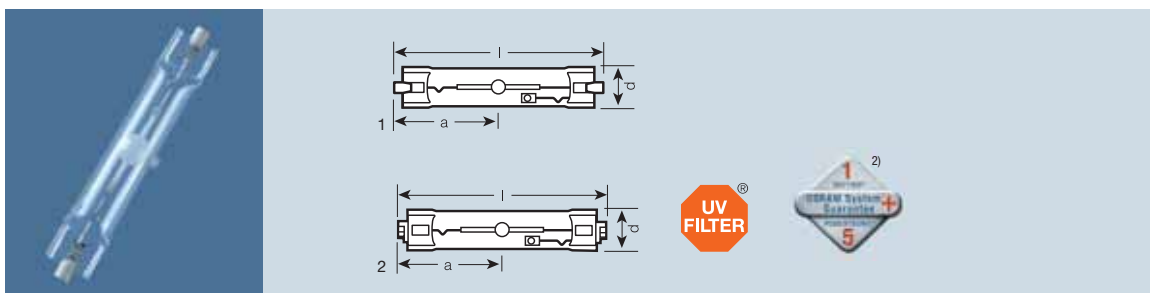
POWERSTAR® HQI®-R lamps are perfectly adjusted.



Metal halide lamps

TS tubular, double-ended, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
POWERBALL® HCl-TS									
HCl-TS 70/830 WDL PB	4050300784069	72	6900	RX7s	21	114.2	57	1	12
HCl-TS 70/942 NDL PB	4050300784106	74	6700	RX7s	21	114.2	57	1	12
HCl-TS 150/830 WDL PB	4050300783987	144	14800	RX7s-24	24	132	66	1	12
HCl-TS 150/942 NDL PB	4050300784007	144	14200	RX7s-24	24	132	66	1	12
HCl-TS 250/830 WDL PB	4050300637730	245	25000	Fc2	25	163	81.5	2	12
HCl-TS 250/942 NDL PB ¹⁾	4008321907707	245	23000	Fc2	25	163	81.5	2	12

All HCl-TS lamps now feature innovative POWERBALL® technology.

POWERBALL® HCl-TS lamps are double-ended UV-reduced lamps.

Approved for use in enclosed luminaires.

Benefits

- Excellent luminous efficacy
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

Applications

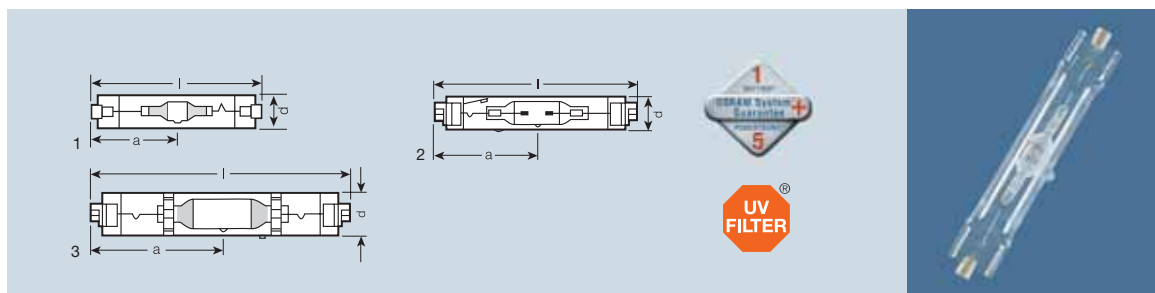
- Prestige retail outlets
- High-quality presentation of merchandise
- Indirect lighting
- Museums, foyers and art galleries
- Building floodlighting and other outdoor applications

Comments

- POWERBALL® lamps produce more light than metal halide lamps of the same output with quartz technology or with cylindrical ceramic arc tubes. Fewer luminaires are therefore needed to provide planned illuminance levels. Energy costs, installation costs and thermal loads are all therefore lower.



Metal halide lamps TS tubular, double-ended Quartz technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
POWERSTAR® HQI®-TS									
HQI-TS 70/WDL	4050300412955	70	5100	RX7s	20	114.2	57	1	12
HQI-TS 70/NDL	4050300412931	70	5700	RX7s	20	114.2	57	1	12
HQI-TS 70/D	4050300437521	70	5500	RX7s	20	114.2	57	1	12
HQI-TS 150/WDL	4050300412979	150	11700	RX7s-24	23	132	66	1	12
HQI-TS 150/NDL	4050300362380	150	12000	RX7s-24	23	132	66	1	12
HQI-TS 150/D	4050300437545	150	12000	RX7s-24	23	132	66	1	12
HQI-TS 250/WDL	4050300436012	250	22000	Fc2	25	163	81.5	2	12
HQI-TS 250/NDL	4050300436036	250	20000	Fc2	25	163	81.5	2	12
HQI-TS 250/D	4050300436050	250	20000	Fc2	25	163	81.5	2	12
HQI-TS 400/NDL ¹⁾	4050300304090	400	36000	Fc2	31	206	103	3	12
HQI-TS 400/D ²⁾	4050300015385	400	37000	Fc2	31	206	103	3	12

POWERSTAR® HQI®-TS lamps are compact double-ended UV-reduced lamps. Approved for use in enclosed luminaires. They are available in Warm White DE LUXE, Neutral White DE LUXE and Daylight.

Benefits

- High luminous efficacy
- Excellent colour rendering properties
- Long life
- High luminous flux
- Low thermal output
- UV FILTER technology (see 5.04)
- The Warm White DE LUXE colour combines well with the light from HALOSTAR® lamps

Applications

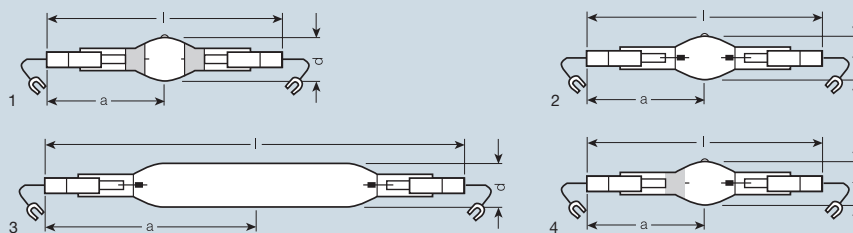
- **Indoors:** Factories, shop interiors, shop windows, foyers, hotels, restaurants, trade fairs, exhibitions, offices, schools, sports halls, etc.
- **Outdoors:** Floodlighting, building facades and monuments

1) Operate only with NAV® control gear
2) Operate with NAV® control gear. If operated with HQI® control gear see "Technical data" from page 5.37

Metal halide lamps

TS tubular, double-ended, no outer bulb

Quartz technology



Product
reference

Product
number

W

lm



d [mm]

l max.
[mm]

LCL
a [mm]

No.



POWERSTAR® HQI®-TS short-arc lamps

HQI-TS 1000/NDL/S	4050300349916	1000	90000	Cable	36	187	93	1	10
HQI-TS 1000/D/S	4050300300092	1000	90000	Cable	36	187	93	1	10
HQI-TS 2000/D/S	4050300271682	2000	200000	Cable	36	187	93	2	10
HQI-TS 2000/D/S/V ¹⁾	4050300977232	2000	200000	Cable	36	187	93	4	10
HQI-TS 2000/NDL/S	4008321910196	2000	200000	Cable	36	187	93	1	10
HQI-TS 2000/NDL/S/V	4008321910202	2000	200000	Cable	36	187	93	4	10

POWERSTAR® HQI®-TS long-arc lamp

HQI-TS 2000/N/L	4050300607344	2000	230000	Cable	32	268	134	3	10
-----------------	---------------	------	--------	-------	----	-----	-----	---	----

POWERSTAR® HQI®-TS lamps (1000/2000) are compact double-ended UV-reduced lamps with no outer bulb. Approved for use in enclosed luminaires.

POWERSTAR® HQI® -TS 2000/D/S

POWERSTAR® HQI®-TS 1000/NDL/S

Benefits

- Extremely compact for small spotlights with a low windage
- Extremely short arc for excellent directional light and very little scatter
- Excellent colour rendering
- Can be used with conventional igniters and control gear
- Instant hot restart is possible with a special igniter

Applications

- Stadiums, sports halls, wide-area lighting, flood-lighting, solar simulation, material testing

POWERSTAR® HQI®-TS 2000/N/L

Benefits

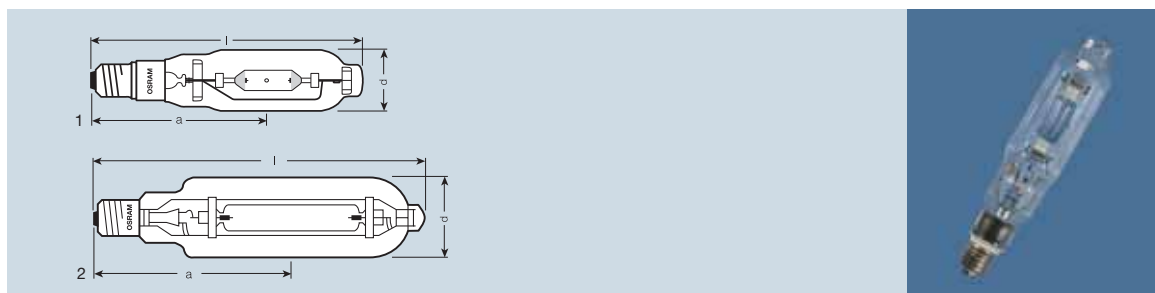
- Arc length 120 mm
- Ideal for compact floodlights
- Can be used with conventional igniters and control gear

Applications

- Semi-professional sports arenas, training facilities, building spotlighting, factory sites



Metal halide lamps T tubular, E40 base, for enclosed luminaires Quartz technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
POWERSTAR® HQI®-T									
HQI-T 1000/D	40503000 15323	1000	85000	E40	76	345	220	1	6
HQI-T 1000/N	4008321 116604	1000	110000	E40	76	345	220	1	6
HQI-T 2000/D	40503000 15330	2000	180000	E40	100	430	265	2	4
HQI-T 2000/N/E SUPER	40503003 01860	2000	240000	E40	100	430	265	2	4
HQI-T 2000/N/SN/ SUPER ¹⁾	40503003 48629	2000	240000	E40	100	430	265	2	4
HQI-T 2000/N/230 V	40503004 21582	2000	220000	E40	100	430	265	2	4
POWERSTAR® HQI®-T, no igniter									
HQI-T 2000/D/I	40503000 15446	2000	180000	E40	100	430	265	2	4
HQI-T 2000/N	40503000 15347	2000	200000	E40	100	430	265	2	4

The successful POWERSTAR® HQI® lamps with E40 screw bases are available in different light colours in 1000 W and 2000 W versions. They are approved for use in enclosed luminaires.

Benefits

- Output of up to 2000 W
- Different light colours

Applications

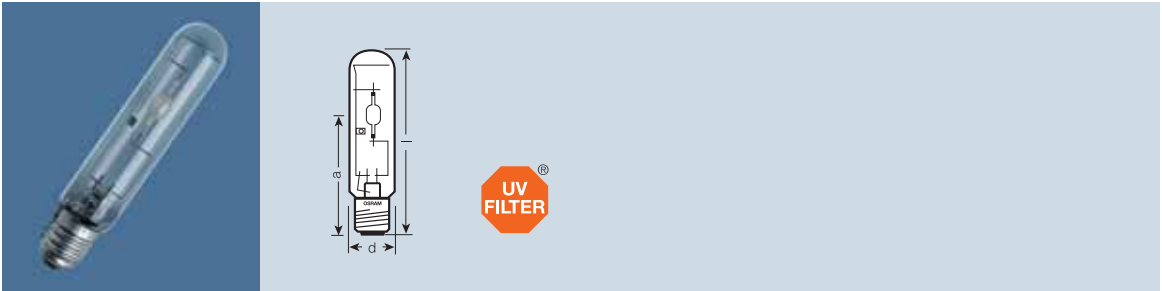
- High-ceiling rooms
- Sports halls and multi-purpose halls

1) Lamps ignite at an ignition voltage of 0.9 to 1.3 kVs; lamps must not be operated with 4 to 5 kV igniters

Metal halide lamps

T tubular, E40 base, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	
POWERBALL® HCl®-T								
HCl-T 250/830 WDL PB	4050300 636849	245	25800	E40	46	226	150	12
HCl-T 250/942 NDL PB ¹⁾	4008321 908308	250	25000	E40	46	226	150	12

Best ceramic technology in POWERBALL® HCl®-T with E40 base. UV-reduced.
Approved for use in enclosed luminaires.

Benefits

- Now in light colours WDL and NDL
- Compatible with all metal halide lamps with E40 screw bases of the same wattage
- Cost benefits in new installations from reduced number of luminaires thanks to improved efficiency of POWERBALL® technology
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

Applications

- Atriums, museums and prestige offices
- Stations and factories
- Sports halls and other public buildings
- Outdoor lighting



Metal halide lamps T tubular, E40 base, for enclosed luminaires Quartz technology



Product reference	Product number	W	lm		 d [mm]	 l max. [mm]	 LCL a [mm]	 No.	
POWERSTAR® HQI®-T									
HQI-T 250/D	40503000 15293	250	20000	E40	46	225	150	1	12
HQI-BT 400/D ¹⁾	4050300 468471	400	35000	E40	62	285	175	2	12
HQI-T 400/N ¹⁾	4050300 324647	400	42000	E40	46	273	175	1	12
POWERSTAR® HQI®-T, coloured									
HQI-T 400 BLUE ²⁾	4050300 258300	360	–	E40	46	275	175	1	12
HQI-T 400 GREEN ²⁾	4050300 258287	360	–	E40	46	275	175	1	12
HQI-T 400 MAGENTA ²⁾	4050300 649535	440	–	E40	46	275	175	1	12

POWERSTAR® HQI®-T with medium output and E40 screw base. Approved for use in enclosed luminaires.

Applications

- Industry
- Large halls

Benefits

- Output of up to 400 W
- Different light colours
- Also available in BLUE, GREEN and MAGENTA
- UV FILTER technology (see 5.04)

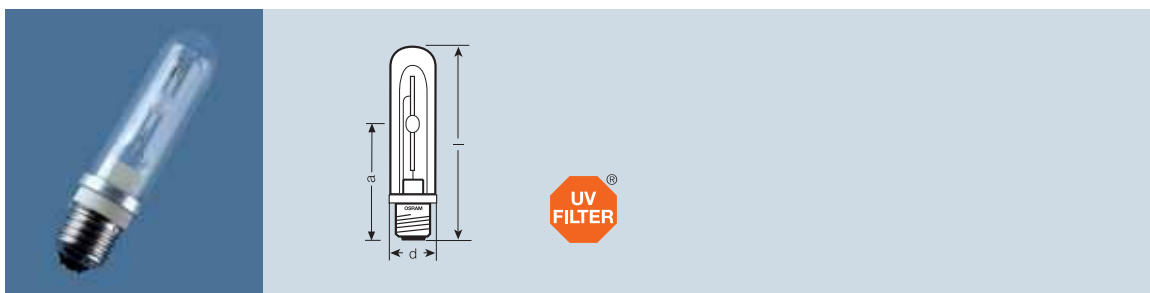
1) Operate with NAV® control gear. If operated with HQI® control gear see "Technical data" from page 5.37

2) Lamps with virtually monochromatic light

Metal halide lamps

T/P tubular, E27 base, for open and enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		 d [mm]	 l max. [mm]	 LCL a [mm]	
POWERBALL® HCl®-T/P								
HCl-T/P 70/830 WDL PB clear ¹⁾	4008321 907714	73	6500	E27	32	125	89	12
HCl-T/P 70/830 WDL PB coated ¹⁾	4008321 907721	73	6400	E27	32	125	89	12
HCl-T/P 70/942 NDL PB clear ¹⁾	4008321 907738	73	6100	E27	32	125	89	12
HCl-T/P 70/942 NDL PB coated ¹⁾	4008321 907745	73	6000	E27	32	125	89	12
HCl-T/P 100/830 WDL PB clear ²⁾	4008321 907752	100	9000	E27	40	140	89	12
HCl-T/P 100/830 WDL PB coated ²⁾	4008321 907769	100	8500	E27	40	140	89	12
HCl-T/P 100/942 NDL PB clear ²⁾	4008321 907776	100	8800	E27	40	140	89	12
HCl-T/P 100/942 NDL PB coated ²⁾	4008321 907783	100	8300	E27	40	140	89	12
HCl-T/P 150/830 WDL PB clear ¹⁾	4008321 907790	145	14200	E27	40	140	89	12
HCl-T/P 150/830 WDL PB coated ¹⁾	4008321 907806	145	14000	E27	40	140	89	12
HCl-T/P 150/942 NDL PB clear ¹⁾	4008321 907813	145	14000	E27	40	140	89	12
HCl-T/P 150/942 NDL PB coated ¹⁾	4008321 907820	145	13300	E27	40	140	89	12

New

POWERBALL® HCl®-T/P lamps have been specially developed for use in open luminaires. They are single-ended and UV-reduced and have an E27 screw base.

Available in clear and coated versions.

Applications

- Wallwashers indoors and outdoors
- Downlights in department stores, museums and exhibition halls
- Industrial lighting
- Outdoor floodlights

Lamps for open luminaires:

Luminaires do not require shields

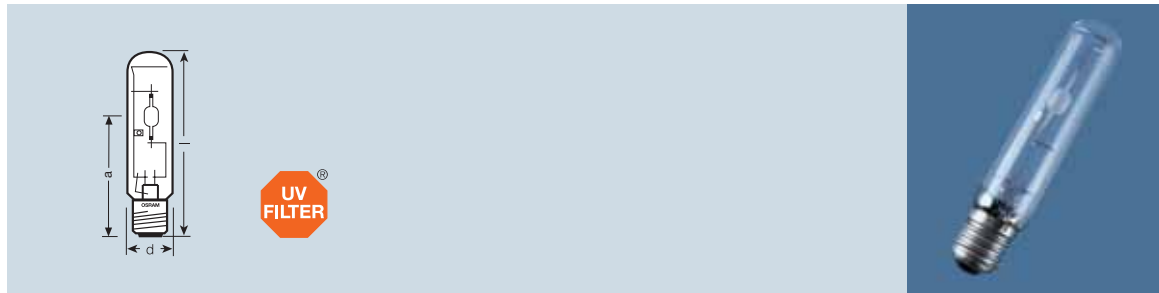
- Lower luminaire costs
- Easier to maintain
- Luminaires easy to clean
- Simple temperature management in the luminaire

Benefits

- New low-maintenance lighting solutions in high-quality ceramic technology
- Maximum protection against shattering thanks to integrated protective glass tube
- Tubular form ideal for lighting solutions with wide-area lighting
- Interchangeable with HCl®-E/P and HCl®-PAR lamps of the same wattage
- E27 screw base for simple lamp handling
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux



Metal halide lamps TT tubular, E27/E40 base, for enclosed luminaires POWERBALL® ceramic technology



Product reference	Product number	W	lm		d [mm]	 l max. [mm]	 LCL a [mm]	
POWERBALL® HCl®-TT								
HCl-TT 70/830 WDL PB	4050300784120	74	7000	E27	30	150	102	12
HCl-TT 150/830 WDL PB	4050300784144	148	14500	E40	46	204	132	12

New

POWERBALL® HCl®-TT lamps provide white light with special flair particularly for outdoor lighting. With E27 or E40 screw base. UV-reduced. Approved for use in enclosed luminaires (see comments).

Benefits

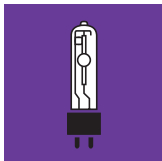
- Existing NAV fittings can be easily upgraded simply by replacing the lamp
- The lamps start on NAV igniters and operate on NAV chokes of the appropriate rating
- Brilliant white light creates an special atmosphere
- Excellent colour perception enhances safety
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

Applications

- Prestige lighting for city centres, streets and parks
- Building floodlighting
- Roads and access routes to shopping centres and residential areas

Comments

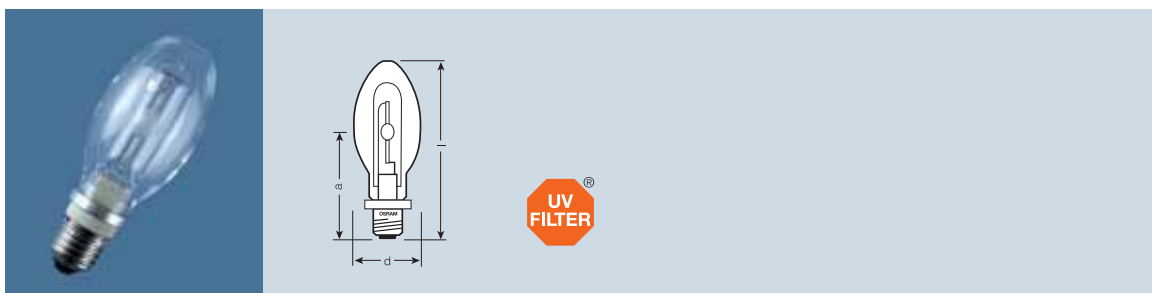
- The lamps may only be operated in fully enclosed luminaires.
- Where possible, use a timer igniter (switch-off time of at least 15 minutes). Otherwise, switch off the luminaire for at least 15 minutes if a brief interruption has occurred to the mains voltage supply.
- HCl®-TT lamps are not approved for operation on reduced power. Lamps operated at dimmed settings suffer a greater loss of luminous flux over their lifetime and a greater colour shift. The product characteristics shown in the catalogue cannot be guaranteed for HCl-TT lamps that are operated at dimmed settings.



Metal halide lamps

E elliptical, E27 base, for open and enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		 d [mm]	 l max. [mm]	 LCL a [mm]	
POWERBALL® HCl®-E/P								
HCl-E/P 35/830 WDL PB clear ¹⁾	4008321 907837	39	3000	E27	54	138	86	12
HCl-E/P 35/830 WDL PB coated ¹⁾	4008321 907844	39	2850	E27	54	138	—	12
HCl-E/P 35/942 NDL PB clear ¹⁾	4008321 907851	39	3000	E27	54	138	86	12
HCl-E/P 35/942 NDL PB coated ¹⁾	4008321 907868	39	2850	E27	54	138	—	12
HCl-E/P 70/830 WDL PB clear	4008321 907875	73	6500	E27	54	138	86	12
HCl-E/P 70/830 WDL PB coated	4008321 907882	73	6400	E27	54	138	—	12
HCl-E/P 70/942 NDL PB clear	4008321 907899	73	6100	E27	54	138	86	12
HCl-E/P 70/942 NDL PB coated	4008321 907905	73	6000	E27	54	138	—	12
HCl-E/P 100/830 WDL PB clear	4008321 907912	100	9000	E27	54	138	86	12
HCl-E/P 100/830 WDL PB coated	4008321 907929	100	8500	E27	54	138	—	12
HCl-E/P 100/942 NDL PB clear ²⁾	4008321 907936	100	8800	E27	54	138	86	12
HCl-E/P 100/942 NDL PB coated ²⁾	4008321 907943	100	8300	E27	54	138	—	12
HCl-E/P 150/830 WDL PB clear	4008321 907950	150	14000	E27	54	138	86	12
HCl-E/P 150/830 WDL PB coated	4008321 907967	150	13300	E27	54	138	—	12
HCl-E/P 150/942 NDL PB clear	4008321 907974	150	14000	E27	54	138	86	12
HCl-E/P 150/942 NDL PB coated	4008321 907981	150	13300	E27	54	138	—	12

POWERBALL® HCl®-E/P ellipsoidal lamps have been specially developed for use in open luminaires. They are single-ended with an E27 screw base, UV-reduced and are available in clear and coated versions.

Lamps for open luminaires (see 5.16).

Benefits

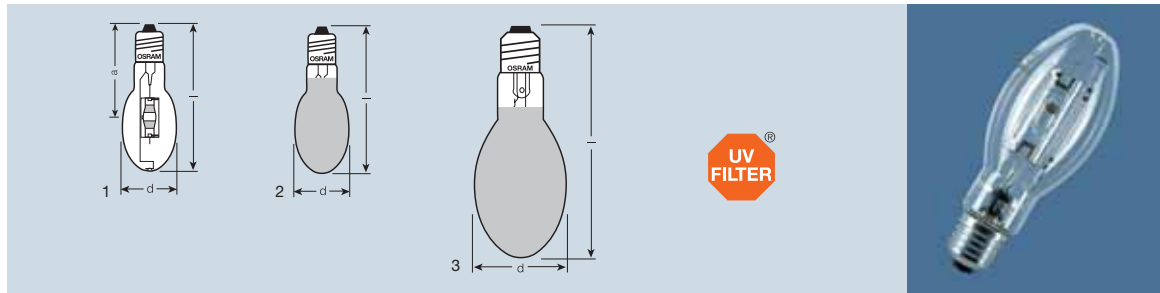
- New low-maintenance lighting solutions in high-quality ceramic technology
- Maximum protection against shattering thanks to integrated protective glass tube
- Elliptical shape ideal for use in rotationally symmetrical open reflectors
- Interchangeable with HQI®-E/P lamps of the same wattage
- E27 screw base for simple lamp handling
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

Applications

- Recessed ceiling downlights in offices, department stores, trade fairs and exhibitions
- Decorative open luminaires
- Indoor and outdoor applications
- Industrial lighting



Metal halide lamps E elliptical, E27/E40 base, for open luminaires Quartz technology



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
POWERSTAR® HQI®-E, clear									
HQI-E 70/WDL clear ¹⁾	4050300 397788	70	5200	E27	55	144	92	1	20
HQI-E 70/NDL clear ¹⁾	4050300 397825	70	5500	E27	55	144	92	1	20
HQI-E 100/WDL clear ¹⁾	4050300 351537	100	8500	E27	55	144	92	1	20
HQI-E 100/NDL clear ¹⁾	4050300 345871	100	8400	E27	55	144	92	1	20
HQI-E 150/WDL clear ¹⁾	4050300 433974	150	12900	E27	55	144	92	1	20
HQI-E 150/NDL clear ¹⁾	4050300 434018	150	12500	E27	55	144	92	1	20
POWERSTAR® HQI®-E, coated									
HQI-E 70/WDL ¹⁾	4050300 397801	70	4700	E27	55	144	–	2	20
HQI-E 70/NDL ¹⁾	4050300 397849	70	5100	E27	55	144	–	2	20
HQI-E 100/WDL ¹⁾	4050300 351551	100	7900	E27	55	144	–	2	20
HQI-E 100/NDL ¹⁾	4050300 345833	100	7700	E27	55	144	–	2	20
HQI-E 150/WDL ¹⁾	4050300 433998	150	11600	E27	55	144	–	2	20
HQI-E 150/NDL ¹⁾	4050300 434032	150	11500	E27	55	144	–	2	20
HQI-E/P 250/D	4050300 637457	250	17000	E40	90	226	–	3	12
HQI-E/P 400/D ²⁾	4050300 637433	400	31000	E40	120	290	–	3	12

POWERSTAR® HQI®-E lamps are single-ended ellipsoidal lamps, approved for open luminaires and UV-reduced.

Benefits

- E27 or E40 screw base for simple lamp handling
- Different light colours
- Available in clear and coated versions
- UV FILTER technology (see 5.04)

Applications

- Downlights in industry, offices and department stores

Comments

- NAV® 100 W chokes and HQI® 150 W igniters are suitable for operating HQI®-E 100 W lamps.

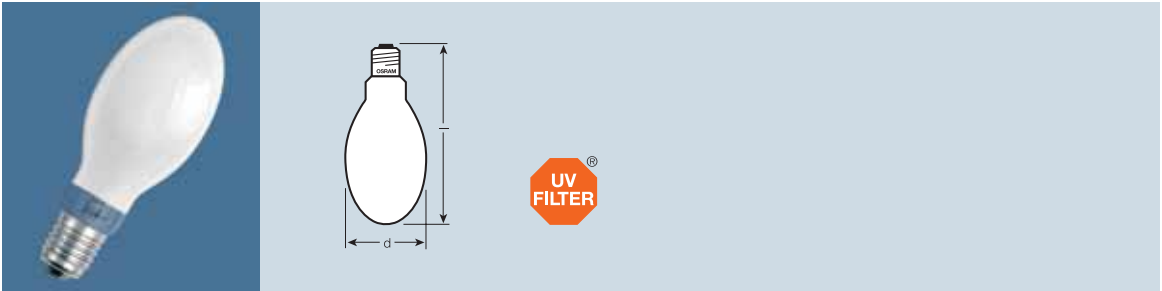
1) Reduced colour shift over lifetime, but has a faster loss of luminous flux. This may be offset by a lower maintenance factor

2) Operate with NAV® control gear. If operated with HQI® control gear see "Technical data" from page 5.37

Metal halide lamps

E ellipsoidal, E40 base, for enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W	lm		 d (mm)	 I max. [mm]	 LCL a (mm)	
POWERBALL® HCI®-E								
HCI-E 250/830 WDL PB	4050300 636825	245	24500	E40	90	226	—	12
HCI-E 250/942 NDL PB ¹⁾	4008321 908315	245	24500	E40	90	226	—	12

Best ceramic technology in POWERBALL® HCI®-E ellipsoidal lamps with very high luminous flux and E40 screw base, UV-reduced. They are approved for use in enclosed luminaires.

Benefits

- Compatible with all metal halide lamps with E40 screw bases of the same wattage
- Cost benefits in new installations from reduced number of luminaires thanks to improved efficiency of POWERBALL® technology
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

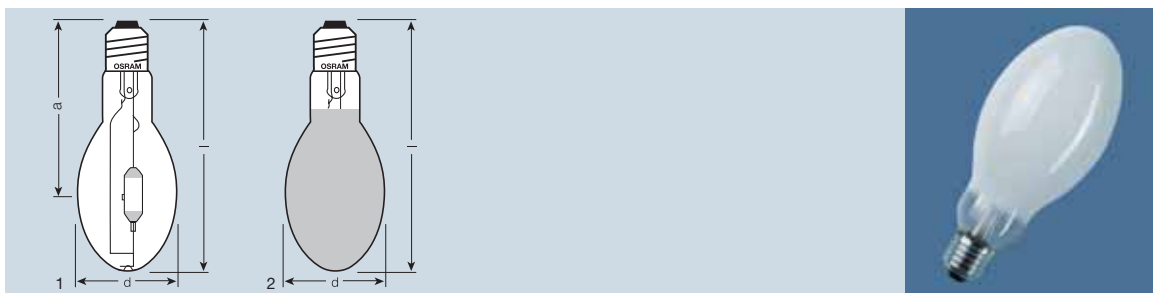
Applications

Rapid upgrade for existing lighting solutions to provide better light colours.

- Atriums, museums and prestige offices
- Stations and factories
- Sports halls and other public buildings



Metal halide lamps E elliptical, E40 base, for enclosed luminaires



Product reference	Product number	W	lm		d [mm]	l max. [mm]	LCL a [mm]	No.	
Quartz technology POWERSTAR® HQI®-E, clear									
HQI-E 400/N clear ¹⁾	4050300292632	440	42000	E40	120	285	198	1	12
Quartz technology POWERSTAR® HQI®-E, coated									
HQI-E 250/D	4050300015248	250	19000	E40	90	226	—	2	12
HQI-E 400/D ¹⁾	4050300019727	400	34000	E40	120	290	—	2	12
HQI-E 400/N ¹⁾	4050300305431	400	40000	E40	120	285	—	2	12
HQI-E 1000/N	4050300015279	1000	100000	E40	165	380	—	2	6

POWERSTAR® HQI®-E lamps are single-ended ellipsoidal lamps of medium to high wattage. Approved for use in enclosed luminaires.

Benefits

- Output of up to 1000 W
- Long life
- Good colour rendering
- E40 screw base for simple lamp handling
- Available in clear and coated versions

Applications

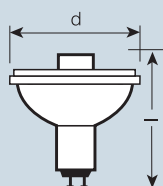
- Large halls
- Downlights in industry, offices and department stores

¹⁾ Operate with NAV® control gear. If operated with HQI® control gear see "Technical data" from page 5.37

Metal halide lamps

R111 reflector, GX8.5 base, for open and enclosed luminaires

POWERBALL® ceramic technology



Product reference	Product number	W		cd		d [mm]		l max. [mm]	
POWERBALL® HCI®-R111									
HCI-R111 20/830 WDL PB 10D ¹⁾	4008321 907998	20	10	17000	GX8.5	111	95	6	
HCI-R111 20/830 WDL PB 24D ¹⁾	4008321 908001	20	24	4200	GX8.5	111	95	6	
HCI-R111 20/830 WDL PB 40D ¹⁾	4008321 908018	20	40	2000	GX8.5	111	95	6	
HCI-R111 35/830 WDL PB 10D ¹⁾	4008321 908025	39	10	35000	GX8.5	111	95	6	
HCI-R111 35/830 WDL PB 24D ¹⁾	4008321 908032	39	24	8500	GX8.5	111	95	6	
HCI-R111 35/830 WDL PB 40D ¹⁾	4008321 908049	39	40	4000	GX8.5	111	95	6	
HCI-R111 35/942 NDL PB 10D ¹⁾	4008321 908056	39	10	35000	GX8.5	111	95	6	
HCI-R111 35/942 NDL PB 24D ¹⁾	4008321 908063	39	24	8500	GX8.5	111	95	6	
HCI-R111 35/942 NDL PB 40D ¹⁾	4008321 908070	39	40	4000	GX8.5	111	95	6	
HCI-R111 70/830 WDL PB 10D ¹⁾	4008321 908087	72	10	55000	GX8.5	111	95	6	
HCI-R111 70/830 WDL PB 24D ¹⁾	4008321 908094	72	24	15000	GX8.5	111	95	6	
HCI-R111 70/830 WDL PB 40D ¹⁾	4008321 908100	72	40	9000	GX8.5	111	95	6	

New

POWERBALL® HCI®-R111 with R111 reflector are approved for use in open luminaires and UV-reduced.

Lamps for open luminaires (see 5.16).

Benefits

- At last a high-intensity solution with a modern R111 reflector, low thermal loading and long life
- The new twist & lock GX8.5 base ensures stable positioning in the luminaire
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

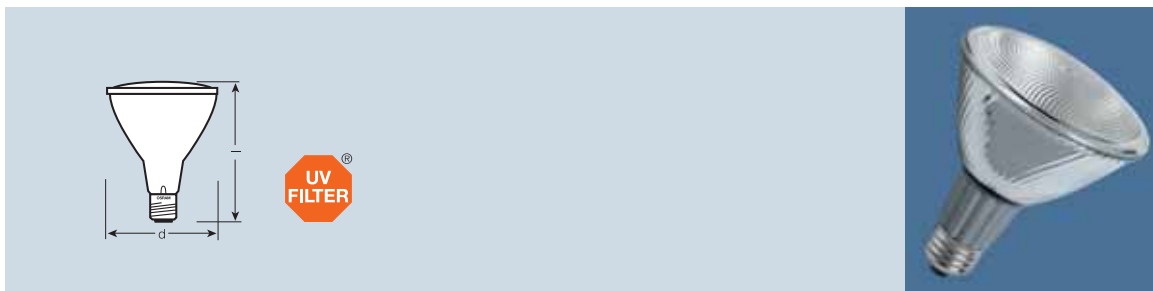
Applications

All indoor lighting, in particular

- Shops
- Malls
- Museums
- Atriums
- Hotels
- Prestige rooms



Metal halide lamps PAR reflector, E27 base, for open and enclosed luminaires POWERBALL® ceramic technology



Product reference	Product number	W	cd					
POWERBALL® HCI®-PAR								
HCI-PAR 20 35/830 WDL PB SP ¹⁾	4008321908162	39	24000	10	E27	65	95	12
HCI-PAR 20 35/830 WDL PB FL ¹⁾	4008321908179	39	5500	30	E27	65	95	12
HCI-PAR 30 20/830 WDL PB SP ²⁾	4008321908148	20	24000	10	E27	97	125	6
HCI-PAR 30 20/830 WDL PB FL ²⁾	4008321908155	20	4000	30	E27	97	125	6
HCI-PAR 30 35/830 WDL PB SP ¹⁾	4008321908209	39	46000	10	E27	97	125	6
HCI-PAR 30 35/830 WDL PB FL ¹⁾	4008321908216	39	8500	30	E27	97	125	6
HCI-PAR 30 70/830 WDL PB SP ¹⁾	4008321908247	73	70000	10	E27	97	125	6
HCI-PAR 30 70/830 WDL PB FL ¹⁾	4008321908254	73	14000	30	E27	97	125	6
HCI-PAR 30 70/830 WDL PB 40D ¹⁾	4008321908261	73	12000	40	E27	97	125	6
POWERSTAR® HCI®-PAR								
HCI-PAR 20 35/830 WDL SP	4050300941936	38	22000	10	E27	65	95	12
HCI-PAR 20 35/830 WDL FL	4050300941950	38	5000	30	E27	65	95	12
HCI-PAR 30 35/830 WDL SP	4050300941974	38	37000	10	E27	97	125	6
HCI-PAR 30 35/830 WDL FL	4050300941998	38	7000	30	E27	97	125	6
HCI-PAR 30 70/830 WDL SP ¹⁾	4050300942018	73	55000	10	E27	97	125	6
HCI-PAR 30 70/830 WDL FL ¹⁾	4050300942032	73	10000	30	E27	97	125	6

New

POWERBALL® HCI®-PAR offers ceramic technology in PAR reflectors. With their tried and trusted screw bases and integrated reflectors, these lamps provide exciting new options for accent lighting. Approved for use in open luminaires and UV-reduced. Lamps for open luminaires (see 5.16).

Benefits

- Integrated reflector for optimum spotlighting or floodlighting
- Simple relamping thanks to tried and trusted E27 screw base
- Simple luminaire design thanks to integrated reflector

- Two reflector sizes PAR 20 and PAR 30 each in two beam angles SP (SPOT) and FL (FLOOD)
- UV FILTER technology (see 5.04)
- All the benefits of innovative POWERBALL® technology (see 5.04), such as excellent colour rendering, low colour spread, constant colour and high luminous flux

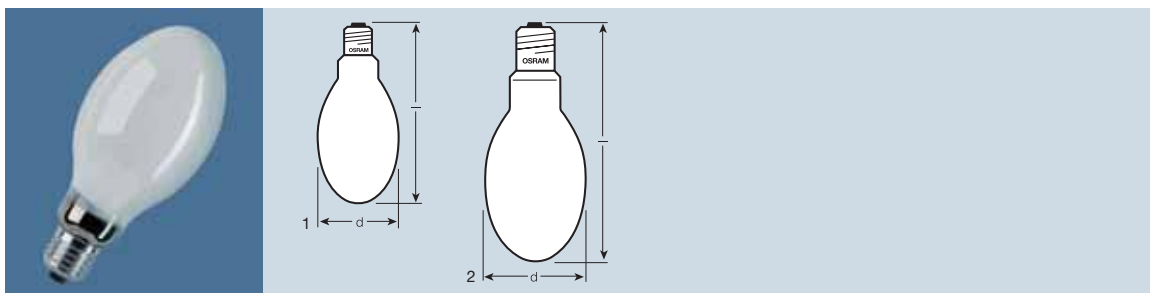
Applications

- Retail premises
- Accent lighting
- Decorative lighting
- Malls
- Industrial lighting
- Outdoors

1) In preparation
2) From 2007

High-pressure sodium vapour lamps

E elliptical, coated



Product reference	Product number	W	lm						
VIALOX® NAV®-E SUPER 4Y¹⁾									
NAV-E 100 SUPER 4Y	4050300015774	100	10200	E40	75	186	–	2	12
NAV-E 150 SUPER 4Y	4050300024370	150	17000	E40	90	226	–	2	12
NAV-E 250 SUPER 4Y	4050300024387	250	31100	E40	90	226	–	2	12
NAV-E 400 SUPER 4Y	4050300024394	410	55500	E40	120	290	–	2	12
VIALOX® NAV®-E 4Y®									
NAV-E 50 4Y	4050300577678	50	3500	E27	70	156	–	1	24
NAV-E 70 4Y	4050300577692	70	5600	E27	70	156	–	1	24
NAV-E 150 4Y	4050300577555	150	14500	E40	90	226	–	2	12
NAV-E 250 4Y	4050300577579	250	27000	E40	90	226	–	2	12
NAV-E 400 4Y	4050300577593	400	48000	E40	120	290	–	2	12
VIALOX® NAV®-E 4Y® with internal igniter									
NAV-E 50/I 4Y	4050300606033	50	3500	E27	70	156	–	1	24
NAV-E 70/I 4Y	4050300606019	70	5600	E27	70	156	–	1	24

VIALOX® NAV® SUPER 4Y®

VIALOX® NAV® SUPER 4Y® lamps are among the brightest and most economical high-pressure sodium lamps.

- Up to 25% longer life
- Up to 20% higher luminous efficacy
- Greater mast spacing
- The same colour properties and applications as standard NAV® lamps
- Better luminous flux maintenance

Applications

- Street lighting
- Tunnel lighting
- Car parks and areas allocated to traffic
- Building floodlighting
- Factory lighting in heavy industry

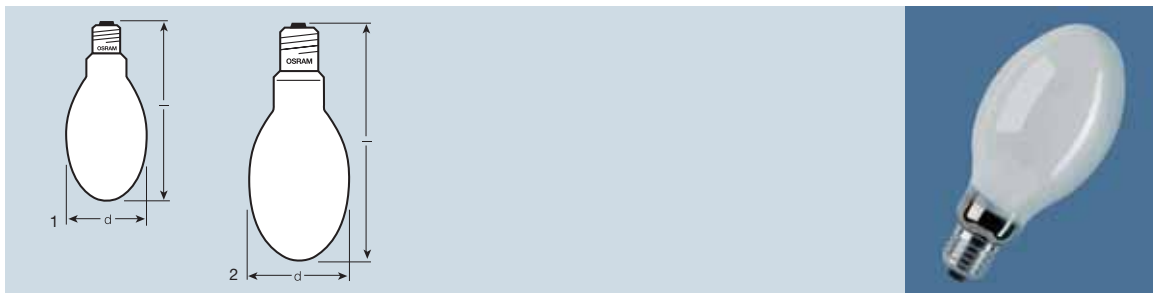
VIALOX® NAV® 4Y®

Extremely economical long-life lamp

- Up to 25% longer life
- Same luminous flux as standard NAV® lamps
- Better luminous flux maintenance
- The same colour properties and applications as standard NAV® lamps



High-pressure sodium vapour lamps E elliptical, coated



Product reference	Product number	W	lm							
VIALOX® NAV®-E (Standard)										
NAV-E 50/E	40503000 15750	50	3500	E27	70	156	—	1	24	
NAV-E 70/E	40503000 15767	70	5600	E27	70	156	—	1	24	
NAV-E 100	4008321 087300	100	8500	E40	75	186	—	2	12	
NAV-E 150 ¹⁾	40503000 15613	150	14500	E40	90	226	—	2	12	
NAV-E 250 ¹⁾	40503000 15620	250	27000	E40	90	226	—	2	12	
NAV-E 400 ¹⁾	40503000 15637	400	48000	E40	120	290	—	2	12	
NAV-E 1000	40503000 15644	1000	120000	E40	165	370	—	2	6	
VIALOX® NAV®-E with internal igniter										
NAV-E 50/I	40503000 15583	50	3500	E27	70	156	—	1	24	
NAV-E 70/I	40503000 15590	70	5600	E27	70	156	—	1	24	
VIALOX® NAV®-E Plug-in (substitute for mercury vapour lamps)										
NAV-E 110	40503000 24318	110	8000	E27	75	170	—	1	40	
NAV-E 210	40503000 15576	210	18000	E40	90	226	—	2	12	
NAV-E 350	40503000 15651	350	34000	E40	120	290	—	2	12	

VIALOX® NAV® with internal igniter

Does not require a separate igniter. Lamps may only be operated with control gear for NAV® lamps. The lamps must not be operated in luminaires equipped with igniters.

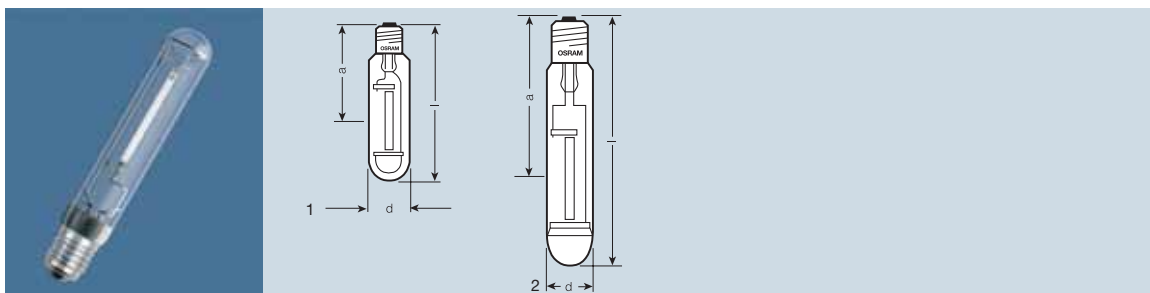
VIALOX® NAV®-E Plug-in

The lamps can be used in luminaires for HQL® 125 W, 250 W or 400 W mercury vapour lamps without any modifications to the existing components, provided the control gear is suitable for the higher operating current of the NAV® Plug-in lamps. Check that the maximum permissible winding temperature as defined in VDE and IEC specifications are not exceeded. If in doubt, consult the manufacturer of the luminaire and/or control gear.

1) Also available in a "mercury-free" version on request

High-pressure sodium vapour lamps

T tubular, clear



Product reference	Product number	W	lm							
VIALOX® NAV®-T SUPER 4Y^①										
NAV-T 50 SUPER 4Y	40503000 24325	50	4400	E27	37	156	104	1	12	
NAV-T 70 SUPER 4Y	40503000 15736	70	6600	E27	37	156	104	1	12	
NAV-T 100 SUPER 4Y	40503000 15743	100	10700	E40	46	211	132	2	12	
NAV-T 150 SUPER 4Y	40503000 24400	150	17500	E40	46	211	132	2	12	
NAV-T 250 SUPER 4Y	40503000 24417	250	33200	E40	46	257	158	2	12	
NAV-T 400 SUPER 4Y	4050300 281179	400	56500	E40	46	285	175	2	12	
NAV-T 600 SUPER 4Y ^②	4050300 275772	600	90000	E40	46	285	175	2	12	
VIALOX® NAV®-T 4Y®										
NAV-T 70 4Y	4050300 579061	70	6000	E27	37	156	104	1	12	
NAV-T 150 4Y	4050300 577616	150	15000	E40	46	211	132	2	12	
NAV-T 250 4Y	4050300 577630	250	28000	E40	46	257	158	2	12	
NAV-T 400 4Y	4050300 577654	400	48000	E40	46	285	175	2	12	
VIALOX® NAV®-T (Standard)										
NAV-T 70	4050300 255590	70	6000	E27	37	156	104	1	12	
NAV-T 100	400832 1087287	100	9000	E40	46	211	132	2	12	
NAV-T 150 ^④	40503000 15668	150	15000	E40	46	211	132	2	12	
NAV-T 250 ^④	40503000 15675	250	28000	E40	46	257	158	2	12	
NAV-T 400 ^④	40503000 15682	400	48000	E40	46	285	175	2	12	
NAV-T 1000	4050300 251417	1000	130000	E40	65	355 ^③	240	2	12	
PLANTASTAR® (for horticulture)^②										
PLANTASTAR 400	4050300 620084	400	56500	E40	46	285	175	1	12	
PLANTASTAR 600	4050300 620107	600	90000	E40	46	285	175	1	12	

NAV® as a clear tubular lamp

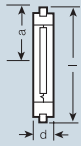
Clear tubular NAV® lamps enable light to be directed with great precision. For new street light installations, this means that mast spacing can be greater. This applies in particular to NAV®-T Super 4Y® lamps with their extremely high luminous efficacy. Potential savings are considerable.

The other product characteristics and possible applications are as described in previous pages.

PLANTASTAR® 400 W and 600 W lamps were developed specifically for applications in commercial horticulture. They enable plants to be intensively cultivated throughout the year.



High-pressure sodium vapour lamps TS tubular, clear, double-ended



**Product
reference**

**Product
number**

W

lm



d (mm)

**l max.
[mm]**

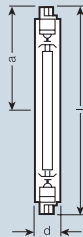
**LCL
a (mm)**



VIALOX® NAV®-TS SUPER 4Y®

Instant hot restart is possible with a special igniter.

NAV-TS 70 SUPER 4Y	40503000 24301	70	6800	RX7s	20	114.2 ¹⁾	57	12
NAV-TS 150 SUPER 4Y	40503000 281667	150	15000	RX7s-24	23	132 ¹⁾	66	12



**Product
reference**

**Product
number**

W

lm



d (mm)

**l max.
[mm]**

**LCL
a (mm)**



VIALOX® NAV®-TS (Standard)

Instant hot restart is possible with a special igniter.

NAV-TS 250	40503000 15705	250	25500	Fc2	23	206	103	12
NAV-TS 400	40503000 15712	400	48000	Fc2	23	206	103	12

NAV® 4-year lamps

VIALOX® NAV® SUPER 4Y® and NAV® 4Y®

4Y® stands for **4** Years. With NAV® 4Y® lamps, the relamping interval for groups of sodium lamps in street lighting can be extended to four years.

Longer relamping intervals

NAV® lamps used to be replaced on a three-year cycle, so just by extending the relamping interval to four years the savings in annual lamp replacement costs amount to 25%.

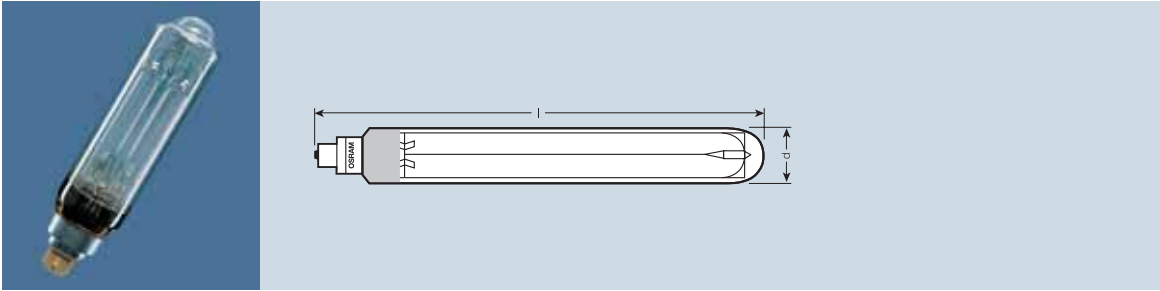
Long-term reduction in premature failures

95% of NAV® 4Y® 50 to 400 W and NAV® SUPER 4Y® 50 to 400 W lamps are still operational after 16,000 hours. This leads to considerable additional savings in replacement costs.

1) Distance between contacts, nominal value

Low-pressure sodium lamps

Tubular, clear with infra-red reflecting coating



Product reference	Product number	W	lm		 d (mm)	 l max. (mm)	
SOX¹⁾							
SOX 18	40503000 15569	18	1800	BY22d	54	216	12
SOX 35	40503000 15514	37	4600	BY22d	54	311	12
SOX 55	40503000 15521	56	8100	BY22d	54	425	12
SOX 90	40503000 15538	91	13500	BY22d	68	528	12
SOX 135	40503000 15545	135	22500	BY22d	68	775	12
SOX 180	40503000 15552	185	32000	BY22d	68	1120	9

SOX low-pressure sodium lamps have a luminous efficacy of up to 178 lm/W.

Benefit

- The emitted light has a monochromatic yellow colour (sodium line 590 nm) for high-contrast visibility in mist and fog

Applications

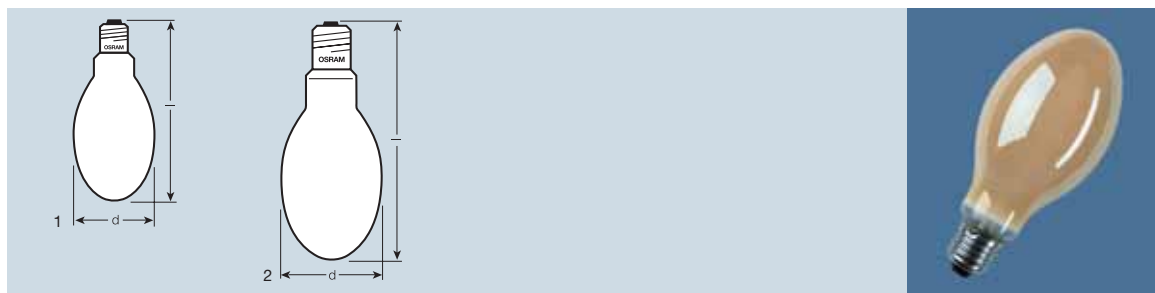
- Lighting for arterial roads and motorways, tunnels, canals and locks

Comments

Colour perception not possible



Mercury vapour lamps E elliptical, coated



Product reference	Product number	W	lm		d [mm]	l max. [mm]	No.	
HQL® 4Y								
HQL 50 4Y	4008321 097859	50	2000	E27	55	130	1	40
HQL 80 4Y	4008321 097811	80	4000	E27	70	156	1	40
HQL 125 4Y	4008321 097835	125	6800	E27	75	170	1	40
HQL® SUPER DE LUXE								
HQL 50 SUPER DE LUXE	40503000 15217	50	1600	E27	55	130	1	40
HQL 80 SUPER DE LUXE	40503000 15224	80	3400	E27	70	156	1	40
HQL 125 SUPER DE LUXE	40503000 18515	125	5700	E27	75	170	1	40
HQL® DE LUXE								
HQL 50 DE LUXE	40503000 15132	50	2000	E27	55	130	1	40
HQL 80 DE LUXE	40503000 15149	80	4000	E27	70	156	1	40
HQL 125 DE LUXE	40503000 15156	125	6800	E27	75	170	1	40
HQL 250 DE LUXE	40503000 15163	250	14000	E40	90	226	2	12
HQL 400 DE LUXE	40503000 15170	400	24000	E40	120	290	2	12
HQL® (Standard)								
HQL 50	40503000 15040	50	1800	E27	55	130	1	40
HQL 80	40503000 12360	80	3800	E27	70	156	1	40
HQL 125	40503000 12377	125	6300	E27	75	170	1	40
HQL 250	40503000 15064	250	13000	E40	90	226	2	12
HQL 400	40503000 15071	400	22000	E40	120	290	2	12
HQL 700	40503000 15088	700	40000	E40	140	339	2	6
HQL 1000	40503000 15095	1000	57000	E40	165	355	2	6

HQL 4Y®

For 4 years of operation in street lighting. Compared to a 3-year relamping interval, 25% of annual maintenance costs can be saved. Warm white light colour.

HQL SUPER DE LUXE

With its golden internal coating (photo see above), the long-life HQL® SUPER DE LUXE lamp provides a light colour similar to that from an incandescent lamp, ideal for prestige lighting.

HQL® DE LUXE

HQL® DE LUXE lamps have a warmer light colour and emit more light than standard HQL® lamps, which makes them even more versatile.

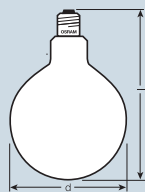
HQL® STANDARD

HQL® STANDARD high-pressure mercury lamps have an yttrium vanadate phosphor. Neutral white light colour.

Applications

- Outdoor lighting for squares, residential areas, parks, main roads and trunk roads
- Lighting for car parks and industrial sites
- Hall and effect lighting
- Decorative plant lighting

Mercury vapour lamps Spherical/reflector



**Product
reference**

**Product
number**

W

lm



HQL®-B SUPER DE LUXE (Spherical)

HQL-B 50 SUPER DE LUXE	4050300015194	50	1600	E27	126	190	6
HQL-B 80 SUPER DE LUXE	4050300015200	80	3000	E27	126	190	6

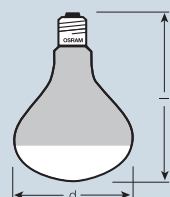
Decorative HQL® SUPER DE LUXE lamps have a golden brown filter coating.

Benefits

- Light colour similar to that of an ordinary light bulb
- The spherical model is virtually glare-free and splash-proof thanks to the oversize bulb

Applications

- **Indoors:** Particularly suitable for luminaires with one or more lamps (e.g. in foyers, shopping arcades, public rooms and other decorative lighting which requires long burning periods)
- **Outdoors:** Pedestrian precincts, parades, parks, gardens, footpaths and orientation lighting



**Product
reference**

**Product
number**

W

lm



HQL®-R DE LUXE (Reflector)

HQL-R 80 DE LUXE	4050300003290	80	3000	E27	125	168	6
------------------	---------------	----	------	-----	-----	-----	---

The mushroom-shaped HQL®-R DE LUXE with reflector provides warm white light and pleasant colour properties.

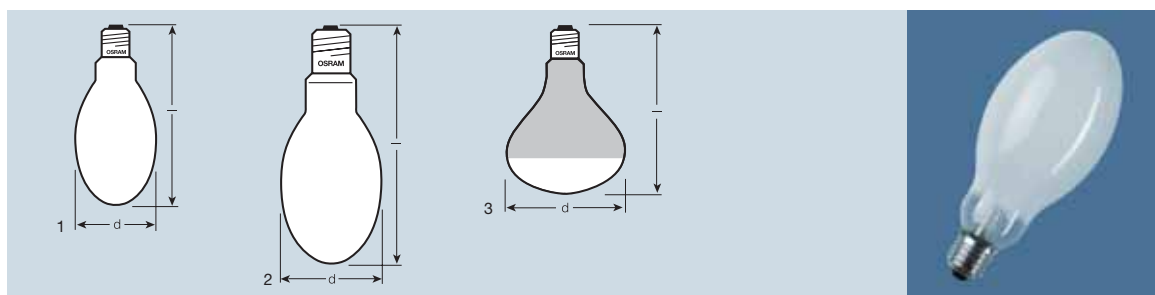
For luminous intensity distribution curves and illuminance see page 5.44.

Applications

- Decorative lighting tasks that require long burning periods
- Lighting for plants
- Aquariums, terrariums
- Protect against splashes



Mercury mixed-light lamps, elliptical/reflector Starters and switch elements



Product reference	Product number	W	lm		d [mm]	l max. [mm]	No.	
HWL®								
Elliptical								
HWL 160 225 V	40503000 15453	160	3100	E27	75	177	1	40
HWL 160 235 V	40503002 16867	160	3100	E27	75	177	1	40
HWL 250 225 V	40503000 15477	250	5600	E40 ²⁾	90	226	2	12
HWL 250 235 V	40503002 19790	250	5600	E40	90	226	2	12
HWL 500 225 V	40503000 15484	500	14000	E40	120	275	2	12
HWL 500 235 V	40503002 16928	500	14000	E40	120	275	2	12
Mushroom shape with reflector. No control gear required.								
HWL R 160 DE LUXE	40503000 15507	160	2500 ¹⁾	E27	125	168	3	6

HWL® mercury tungsten blended lamps have an yttrium vanadate phosphor.

Benefits

- HWL® lamps can be used instead of incandescent lamps because they do not need either control gear or igniters
- Last longer than incandescent lamps

Applications

- Factory and hall lighting with low-cost installations
- Upgrading light fittings with high-wattage incandescent lamps

Product reference	Product number		
Starters and switch elements			
STE 501	40503000 12841	Replacement starter element for igniters	800
SE 600	40503000 16948	Replacement switch element for igniters	800

Some igniters for POWERSTAR® and VIALOX® are equipped with STE 501 (built-in glow starter) or with SE 600 (built-in spark gap). Do not interchange these elements.

We recommend that STE 501 and SE 600 be replaced each time the lamp is replaced.

1) For luminous intensity distribution curve see page 5.44
2) Also available with E27 base on request

Which lamp for which application?

Applications		POWER- BALL® HCI®	POWER- BALL® HCI® Shoplight	POWER- STAR® HQL®	HQL® DE LUXE	HQL® SUPER DE LUXE	HWL®	VIALOX® NAV® SUPER 4Y®	VIALOX® NAV® NAV® 4Y®	SOX
Offices and administrative										
buildings	Open-plan offices, foyers	●	●	●						
	Corridors	●	●	●						
Industry, trade and commerce	Chemical and plastics industries		●	●	●	●				
	Electrical, precision, wood and paper industries	●	●	●						
	Foodstuffs	●	●	●						
	Textiles, leather goods	●	●	●						
	Printing	●		●						
	Automotive and mech. industries			●	●	●				
	Power stations and distr. heat. plants			●		●				
	Laboratories		●	●		●				
	Steel mills, foundries and gravel plants				●			●	●	●
	Cement works				●			●	●	●
	Warehouses, transport depots			●	●				●	
Schools and										
colleges	Auditoriums, libraries	●	●	●						
Retail	Groceries, bakeries, delicatessen	●	●	●						
outlets	Textiles, leather goods	●	●	●						
Shop	Photo, watches, jewellery	●	●	●						
windows	Cosmetics, hairdressers	●	●	●						
	Flowers	●	●	●						
	Supermarkets	●	●	●						
	Department stores	●	●	●						
Public and amenity areas	Foyers	●	●	●						
	Restaurants	●	●	●						
	Museums, art galleries	●	●	●						
	Exhibition halls and trade fairs	●	●	●		●				
	Sports halls and leisure centres	●		●						
Hospitals and										
surgeries	Consulting and treatment rooms	●	●	●						
Traffic	Main streets	●		●		●				
installations	Pedestrian areas	●		●		●				
	Arterial roads and motorways							●	●	●
	Squares, bridges	●		●		●		●	●	
	Tunnels, subways	●						●	●	●
	Side streets	●		●	●		●	●		
	Pedestrian crossings	●		●				●		●
	Junctions	●		●	●			●		●
	Parks and gardens	●		●	●	●	●			
	Canals, locks							●	●	●
	Railway yards							●	●	
	Airports, aprons			●				●		
	Factory yards, parking lots			●	●			●	●	
	Electrical plant			●	●			●	●	●
	Shipyards, ports, quays			●	●			●	●	●
	Mines, stockpiles, storage yards			●	●			●	●	●
	Refineries			●	●		●	●	●	
	Building sites			●	●			●	●	
Sports	Sports grounds			●				●		
grounds	Stadium floodlighting			●						
Flood-	Buildings, monuments	●		●	●			●	●	
lighting	Parks, gardens	●		●	●	●				
Special	Plant lighting	●		●		● ¹⁽³⁾				
applications	Aquariums, terrariums	● ³⁾	● ³⁾	● ³⁾	● ³⁾					
	Horticulture			●				● ²⁾		
	Colour film and TV productions	●	●	●						
	Theatre lighting	●	●	●						
	Surface material testing	●	●	●						●
	Colour fastness testing	●	●	●						

For spectral power distributions see page 5.33

5.32

1) Specifically reflector lamps such as HQL®-R DE LUXE and
HWL®-R DE LUXE

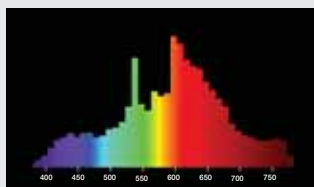
2) PLANTASTAR®

3) Splash-proof and jet-proof fittings only

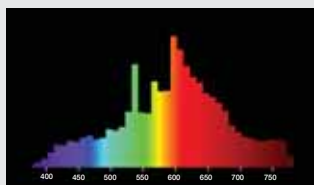
Relative spectral power distribution of discharge lamps

Visible range from 380 to 780 nm, relative spectral emission per 10 nm.

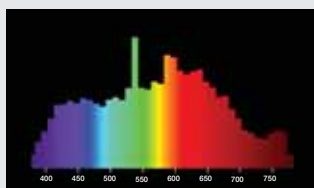
POWERSTAR® HQL®/HCL® lamps



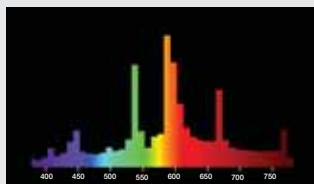
HCL® /930 Shoplight



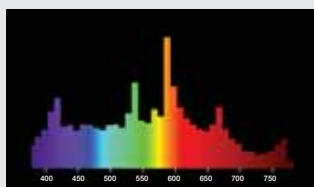
HCL® /830 WDL



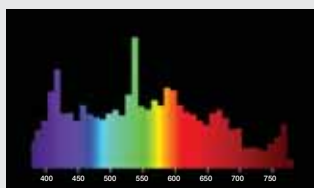
HCL® /942 NDL



HCL®-TS /WDL

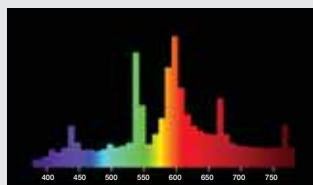


HCL®-TS /NDL

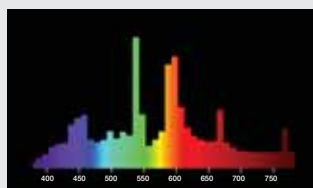


HCL®-TS /D

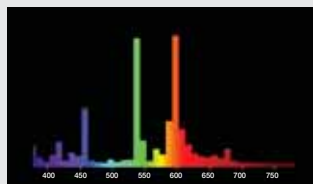
HQL® lamps



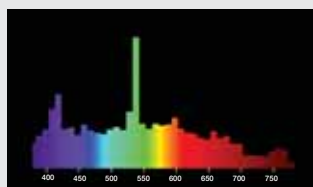
HQL®-T /WDL G12



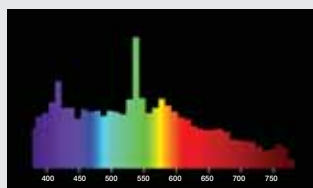
HQL®-T /NDL G12



HQL®-T /N E40

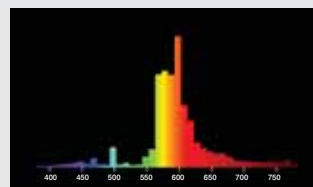


HQL®-T /D E40

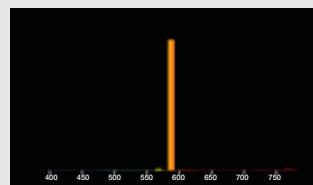


HQL®-TS /D/S cable

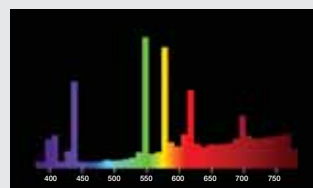
VIALOX® NAV®- and SOX lamps, HWL®- and HQL® lamps



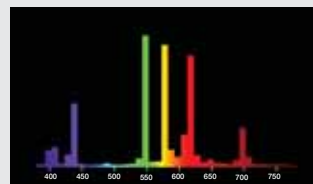
NAV®/NAV® Super 4Y



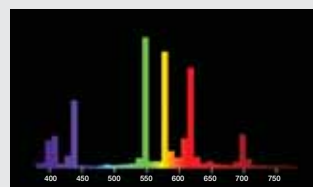
SOX



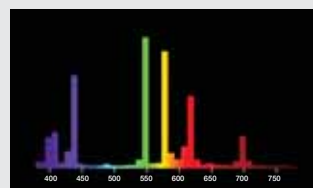
HWL®



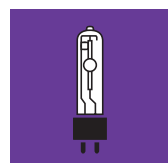
HQL® Super de Luxe



HQL® de Luxe



HQL®

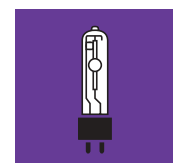


Note: These spectral power distributions do not show the colours accurately. The colour printing process is not able to provide an accurate match with the true spectral colours.

Technical data

Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu\text{F}^{1)}$	Circuit diagram no. ²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ³⁾
HCI-E 250/830 WDL PB	2.9	245	32	2/7	24500	100	1 B	3000	universal
HCI-E 250/942 NDL PB	2.9	245	32	2/7	24500	100	1 A	4200	universal
HCI-E/P 35/830 WDL PB clear ⁵⁾	0.5	45	6	2/7	3000	77	1 B	3000	universal
HCI-E/P 35/830 WDL PB coated ⁵⁾	0.5	45	6	2/7	2850	73	1 B	3000	universal
HCI-E/P 35/942 NDL PB clear ⁵⁾	0.5	45	6	2/7	3000	77	1 A	4200	universal
HCI-E/P 35/942 NDL PB coated ⁵⁾	0.5	45	6	2/7	2850	73	1 A	4200	universal
HCI-E/P 70/830 WDL PB clear ⁴⁾⁵⁾	0.98	85	12	2/7	6500	89	1 B	3000	universal
HCI-E/P 70/830 WDL PB coated ⁴⁾	0.98	85	12	2/7	6400	88	1 B	3000	universal
HCI-E/P 70/942 NDL PB clear ⁴⁾⁵⁾	0.98	85	12	2/7	6100	84	1 A	4200	universal
HCI-E/P 70/942 NDL PB coated	0.98	85	12	2/7	6000	82	1 A	4200	universal
HCI-E/P 100/830 WDL PB clear	1.2	115	16	2/7	9000	90	1 B	3000	universal
HCI-E/P 100/830 WDL PB coated	1.2	115	16	2/7	8500	85	1 B	3000	universal
HCI-E/P 100/942 NDL PB clear ⁷⁾	1.2	115	16	2/7	8800	88	1 A	4200	universal
HCI-E/P 100/942 NDL PB coated ⁷⁾	1.2	115	16	2/7	8300	83	1 A	4200	universal
HCI-E/P 150/830 WDL PB clear ⁴⁾⁵⁾	1.8	170	20	2/7	14000	93	1 B	3000	universal
HCI-E/P 150/830 WDL PB coated	1.8	170	20	2/7	13300	89	1 B	3000	universal
HCI-E/P 150/942 NDL PB clear ⁴⁾⁵⁾	1.8	170	20	2/7	14000	93	1 A	4200	universal
HCI-E/P 150/942 NDL PB coated	1.8	170	20	2/7	13300	89	1 A	4200	universal
HCI-PAR 20 35/830 WDL PB SP ⁵⁾	0.5	45	6	2/7	24000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 20 35/830 WDL PB FL ⁵⁾	0.5	45	6	2/7	5500 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 20/830 WDL PB SP ⁷⁾	0.22	23	EVG	7	24000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 20/830 WDL PB FL ⁷⁾	0.22	23	EVG	7	4000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 35/830 WDL PB SP ⁵⁾	0.5	45	6	2/7	46000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 35/830 WDL PB FL ⁵⁾	0.5	45	6	2/7	8500 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 70/830 WDL PB SP ⁵⁾	0.98	85	12	2/7	70000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 70/830 WDL PB FL ⁵⁾	0.98	85	12	2/7	14000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 70/830 WDL PB 40D ⁵⁾	0.98	85	12	2/7	12000 ⁶⁾	—	1 B	—	—
HCI-PAR 20 35/830 WDL SP ⁴⁾	0.5	48	6	2/7	22000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 20 35/830 WDL FL ⁴⁾	0.5	48	6	2/7	5000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 35/830 WDL SP ⁴⁾	0.5	48	6	2/7	37000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 35/830 WDL FL ⁴⁾	0.5	48	6	2/7	7000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 70/830 WDL SP ⁴⁾⁵⁾	0.97	88	12	2/7	55000 ⁶⁾	—	1 B	3000	universal
HCI-PAR 30 70/830 WDL FL ⁴⁾⁵⁾	0.97	88	12	2/7	10000 ⁶⁾	—	1 B	3000	universal

Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu\text{F}^{1)}$	Circuit diagram no. ²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ³⁾
HCI-R111 20/830 WDL PB 10D ⁵⁾	0.22	23	EVG	7	17000 ⁶⁾	—	1 B	3000	universal
HCI-R111 20/830 WDL PB 24D ⁵⁾	0.22	23	EVG	7	4200 ⁶⁾	—	1 B	3000	universal
HCI-R111 20/830 WDL PB 40D ⁵⁾	0.22	23	EVG	7	2000 ⁶⁾	—	1 B	3000	universal
HCI-R111 35/830 WDL PB 10D ⁵⁾	0.50	45	6	2/7	35000 ⁶⁾	—	1 B	3000	universal
HCI-R111 35/830 WDL PB 24D ⁵⁾	0.50	45	6	2/7	8500 ⁶⁾	—	1 B	3000	universal
HCI-R111 35/830 WDL PB 40D ⁵⁾	0.50	45	6	2/7	4000 ⁶⁾	—	1 B	3000	universal
HCI-R111 35/942 NDL PB 10D ⁵⁾	0.50	45	6	2/7	35000 ⁶⁾	—	1 A	4200	universal
HCI-R111 35/942 NDL PB 24D ⁵⁾	0.50	45	6	2/7	8500 ⁶⁾	—	1 A	4200	universal
HCI-R111 35/942 NDL PB 40D ⁵⁾	0.50	45	6	2/7	4000 ⁶⁾	—	1 A	4200	universal
HCI-R111 70/830 WDL PB 10D ⁵⁾	0.98	85	12	2/7	55000 ⁶⁾	—	1 B	3000	universal
HCI-R111 70/830 WDL PB 24D ⁵⁾	0.98	85	12	2/7	15000 ⁶⁾	—	1 B	3000	universal
HCI-R111 70/830 WDL PB 40D ⁵⁾	0.98	85	12	2/7	9000 ⁶⁾	—	1 B	3000	universal
HCI-T 35/830 WDL PB ⁴⁾⁵⁾	0.5	45	6	2/7	3400	92	1 B	3000	universal
HCI-T 35/930 WDL PB ⁵⁾	0.5	39	6	2/7	3100	79	1 A	3000	universal
HCI-T 35/942 NDL PB ⁴⁾⁵⁾	0.5	45	6	2/7	3300	89	1 A	4200	universal
HCI-T 70/830 WDL PB ⁴⁾	0.96	85	12	2/7	7000	97	1 B	3000	universal
HCI-T 70/930 WDL PB ⁴⁾	0.96	85	12	2/7	6400	88	1 A	3000	universal
HCI-T 70/942 NDL PB ⁴⁾⁵⁾	0.96	85	12	2/7	6700	93	1 A	4200	universal
HCI-T 100/830 WDL PB ⁷⁾	1.1	115	16	2/7	9500	95	1 B	3000	universal
HCI-T 100/942 NDL PB ⁷⁾	1.1	115	16	2/7	9300	93	1 A	4200	universal
HCI-T 150/830 WDL PB ⁴⁾	1.8	170	20	2/7	15500	107	1 B	3000	universal
HCI-T 150/942 NDL PB ⁴⁾⁵⁾	1.8	170	20	2/7	14500	100	1 A	4200	universal
HCI-T 250/830 WDL PB	2.8	245	32	2/7	25800	105	1 B	3000	universal
HCI-T 250/942 NDL PB ⁵⁾	2.8	250	32	2/7	25000	100	1 A	4200	universal
HCI-TC 20/830 WDL PB	0.22	23	EVG	7	1700	85	1 B	3000	universal
HCI-TC 35/830 WDL PB ⁴⁾⁵⁾	0.5	45	6	2/7	3400	92	1 B	3000	universal
HCI-TC 35/930 WDL PB ⁵⁾	0.5	45	6	2/7	3000	79	1 A	3000	universal
HCI-TC 35/942 NDL PB ⁴⁾⁵⁾	0.5	45	6	2/7	3200	86	1 A	4200	universal
HCI-TC 70/830 WDL PB ⁴⁾⁵⁾	0.96	85	12	2/7	6900	96	1 B	3000	universal
HCI-TC 70/930 WDL PB ⁴⁾⁵⁾	0.96	85	12	2/7	6300	86	1 A	3000	universal
HCI-TC 70/830 WDL ⁴⁾	0.96	85	12	2/7	6600	92	1 B	3000	universal
HCI-TC 70/942 NDL ⁴⁾⁵⁾	0.96	85	12	2/7	6300	88	1 A	4200	universal
HCI-TF 20/830 WDL PB ⁷⁾	0.22	23	EVG	7	1700	85	1 B	3000	universal
HCI-TM 250/830 WDL PB	2.90	280	32	2/7	26000	106	1 B	3000	universal
HCI-TM 250/942 NDL PB ⁵⁾	2.90	280	32	2/7	25000	102	1 A	4200	universal
HCI-TM 400/942 NDL PB ⁷⁾	4.45	460	35	2/7	40000	100	1 A	4200	universal



1) Typical value at rated voltage and $\cos \varphi \geq 0.9$

2) For circuit diagrams see page 5.44

3) For examples see page 5.45

4) For the advantages of operation with POWERTRONIC® see Section 11

5) In preparation

6) Axial luminous intensity cd

7) From 2007

Technical data

Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu\text{F}^{1)}$	Circuit diagram no. ²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ³⁾
HCI-T/P 70/830 WDL PB clear ⁵⁾	0.98	85	12	2/7	6500	89	1 B	3000	universal
HCI-T/P 70/830 WDL PB coated ⁵⁾	0.98	85	12	2/7	6400	88	1 B	3000	universal
HCI-T/P 70/942 NDL PB clear ⁵⁾	0.98	85	12	2/7	6100	84	1 A	4200	universal
HCI-T/P 70/942 NDL PB coated ⁵⁾	0.98	85	12	2/7	6000	82	1 A	4200	universal
HCI-T/P 100/830 WDL PB clear ⁶⁾	1.20	115	16	2/7	9000	90	1 B	3000	universal
HCI-T/P 100/830 WDL PB coated ⁶⁾	1.20	115	16	2/7	8500	85	1 B	3000	universal
HCI-T/P 100/942 NDL PB clear ⁶⁾	1.20	115	16	2/7	8800	88	1 A	4200	universal
HCI-T/P 100/942 NDL PB coated ⁶⁾	1.20	115	16	2/7	8300	83	1 A	4200	universal
HCI-T/P 150/830 WDL PB clear ⁵⁾	1.80	170	20	2/7	14200	98	1 B	3000	universal
HCI-T/P 150/830 WDL PB coated ⁵⁾	1.80	170	20	2/7	14000	97	1 B	3000	universal
HCI-T/P 150/942 NDL PB clear ⁵⁾	1.80	170	20	2/7	14000	97	1 A	4200	universal
HCI-T/P 150/942 NDL PB coated ⁵⁾	1.80	170	20	2/7	13300	92	1 A	4200	universal
HCI-TS 70/830 WDL PB ⁴⁾	0.95	85	12	2/7	6900	96	1 B	3000	p 45
HCI-TS 70/942 NDL PB ⁴⁾⁵⁾	0.98	85	12	2/7	6700	91	1 A	4200	p 45
HCI-TS 150/830 WDL PB ⁴⁾⁵⁾	1.8	144	20	2/7	14800	103	1 B	3000	p 45
HCI-TS 150/942 NDL PB ⁴⁾⁵⁾	1.8	170	20	2/7	14200	99	1 A	4200	p 45
HCI-TS 250/830 WDL PB	3.0	285	32	2/7	25000	102	1 B	3000	p 45
HCI-TS 250/942 NDL PB ⁵⁾	3.0	285	32	2/7	23000	94	1 A	4200	p 45
HCI-TT 70/830 WDL PB	0.92	74	12	2/7	7000	95	1 B	3000	universal
HCI-TT 150/830 WDL PB	1.8	148	20	2/7	14500	98	1 B	3000	universal



Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu\text{F}^{(1)}$	Circuit diagram no. ⁽²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ⁽³⁾
HQI-E 70/WDL ⁽⁷⁾⁽⁸⁾	0.95	89	12	2/7	4700	64	2 A	3200	universal
HQI-E 70/WDL clear ⁽⁷⁾⁽⁸⁾	0.95	89	12	2/7	5200	71	2 A	3100	universal
HQI-E 70/NDL ⁽⁷⁾⁽⁸⁾	1.0	89	12	2/7	5100	70	2 A	4100	universal
HQI-E 70/NDL clear ⁽⁷⁾⁽⁸⁾	1.0	89	12	2/7	5500	75	2 A	4200	universal
HQI-E 100/WDL ⁽⁷⁾	1.1	115	16	2	7900	79	2 A	3200	universal
HQI-E 100/WDL clear ⁽⁷⁾	1.1	115	16	2	8500	85	2 A	3100	universal
HQI-E 100/NDL ⁽⁷⁾	1.1	115	16	2	7700	77	1 B	4100	universal
HQI-E 100/NDL clear ⁽⁷⁾	1.1	115	16	2	8400	84	1 B	4200	universal
HQI-E 150/WDL ⁽⁷⁾⁽⁸⁾	1.8	170	20	2/7	11600	77	2 A	2900	universal
HQI-E 150/WDL clear	1.8	170	20	2/7	12900	86	2 A	3000	universal
HQI-E 150/NDL ⁽⁷⁾⁽⁸⁾	1.8	170	20	2/7	11500	77	1 B	3800	universal
HQI-E 150/NDL clear ⁽⁷⁾⁽⁸⁾	1.8	170	20	2/7	12500	83	1 B	4200	universal
HQI-E 250/D	3.0	270	32	2	19000	78	1 A	5200	universal ⁽⁴⁾
HQI-E 400/N ⁽⁵⁾⁽⁷⁾	3.5	410	35	2	34000	90	2 B	4400	h 45
HQI-E 400/N ⁽⁶⁾⁽⁷⁾	4.6	480	45	2	40000	94	2 B	3800	h 45
HQI-E 400/N clear ⁽⁵⁾⁽⁷⁾	3.5	410	35	2	34000	90	2 B	4600	h 45
HQI-E 400/N clear ⁽⁶⁾⁽⁷⁾	4.6	480	45	2	42000	94	2 B	4000	h 45
HQI-E 400/D ⁽⁵⁾	3.6	400	35	2	26000	72	1 A	5500	universal
HQI-E 400/D ⁽⁶⁾	3.8	460	45	2	34000	81	1 A	5300	universal
HQI-E 1000/N	9.5	1065	85	2	100000	80	2 B	3500	h 45
HQI-E/P 250/D	3.0	270	32	2	17000	71	1 A	5200	universal
HQI-E/P 400/D ⁽⁵⁾	3.5	400	35	2	25000	71	1 A	5200	universal
HQI-E/P 400/D ⁽⁶⁾	3.8	420	45	2	31000	76	1 A	4700	universal
HQI-R 150/NDL/FO ⁽⁸⁾	1.8	170	20	2/7	11000	73	1 B	4200	p 15
HQI-T 70/WDL ⁽⁸⁾⁽¹⁴⁾	1.0	91	12	2/7	5300	71	1 B	3000	universal
HQI-T 70/NDL ⁽⁸⁾⁽¹⁴⁾	1.0	91	12	2/7	5800	77	1 B	4200	universal
HQI-T 150/WDL ⁽⁸⁾⁽¹⁴⁾	1.8	170	20	2/7	13000	87	1 B	3000	universal
HQI-T 150/NDL ⁽⁸⁾⁽¹⁴⁾	1.8	170	20	2/7	13000	87	1 B	4200	universal
HQI-T 250/D	3.0	270	32	2	20000	82	1 A	5200	universal ⁽⁴⁾
HQI-BT 400/D ⁽⁵⁾⁽¹³⁾	3.5	400	35	2	27000	75	1 B	5900	universal
HQI-BT 400/D ⁽⁶⁾⁽¹³⁾	4.0	460	45	2	35000	83	1 A	5200	universal
HQI-T 400 BLUE	3.6	400	35	2	—	—	—	—	p 55
HQI-T 400 GREEN	3.6	400	35	2	—	—	—	—	p 55
HQI-T 400 MAGENTA	4.2	470	45	2	—	—	—	—	p 55
HQI-T 400/N ⁽⁵⁾⁽⁷⁾	3.6	410	35	2	34000	90	2 B	4000	p 45
HQI-T 400/N ⁽⁶⁾⁽⁷⁾	4.6	475	45	2	42000	95	2 B	3500	p 45
HQI-T 1000/D	9.5	1115	85	2	85000	81	1 A	7250	p 30
HQI-T 1000/N	9.5	1065	85	2	110000	110	2 B	3500	p 30
HQI-T 2000/N ⁽¹⁰⁾	8.8	2080	37	1	200000 ⁽⁹⁾	100	2 B	4000	p 60
HQI-T 2000/N/230 V ⁽¹²⁾	16.5	2070	125	2	190000	95	2 B	4400	p 30
HQI-T 2000 N/E SUPER	8.8	2080	37	2	240000 ⁽⁹⁾	120	2 B	4400	p 60
HQI-T 2000/N/SN SUPER ⁽¹¹⁾	8.8	2080	37	2	220000	120	2 B	4000	p 60
HQI-T 2000/D	10.3	2130	60	2	180000	88	1 A	7250	p 30
HQI-T 2000/D/I	10.3	2130	60	1	180000	88	1 A	7250	p 30
HQI-TS 70/WDL ⁽⁸⁾	1.0	91	12	2/7	5100	71	2 A	3000	p 45
HQI-TS 70/NDL ⁽⁸⁾	1.0	89	12	2/7	5700	76	1 B	4000	p 45
HQI-TS 70/D ⁽⁹⁾	1.0	95	12	2/7	5500	73	1 B	5200	p 45

1) Typical value at rated voltage and $\cos \varphi \geq 0.9$

2) For circuit diagrams see page 5.44

3) For examples see page 5.45

4) Colour shifts are possible in the base-down burning position

5) With HQI® control gear

6) Operate with NAV® control gear

7) For reduction in luminous flux see page 5.19, footnote 1)

8) For the advantages of operation with POWERTRONIC® see Section 11

9) 170,000 lm in the vertical burning position

10) No igniter required

11) Lamps ignite at an ignition voltage of 0.9 to 1.3 kV

12) Specially developed for 230 V control gear. Excellent luminous flux behaviour: 190,000 lumen after 4000 hours of operation

13) Data applies also to discontinued type HQI®-T 400 W/D

14) For the horizontal burning position, mount the holder so that the lamp electrodes are not arranged one on top of the other



Technical data

Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu F^{1)}$	Circuit diagram no. ²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ³⁾
HQI-TS 150/WDL ¹¹⁾	1.8	170	20	2	11700	78	2 A	3000	p 45
HQI-TS 150/NDL ¹¹⁾	1.8	170	20	2	12000	80	1 B	4200	p 45
HQI-TS 150/D ¹¹⁾	1.8	170	20	2	12000	80	1 A	5200	p 45
HQI-TS 250/WDL	2.8	270	32	2	22000	88	1 B	3200	p 45
HQI-TS 250/NDL	3.0	270	32	2	20000	82	1 B	4200	p 45
HQI-TS 250/D	3.0	270	32	2	20000	82	1 A	5100	p 45
HQI-TS 400/NDL ¹⁰⁾	4.1	440	45	2	36000	90	1 B	4200	p 45
HQI-TS 400/D ¹²⁾	3.6	385	35	2	31000	89	1 A	5600	p 45
HQI-TS 400/D ¹³⁾	4.1	440	45	2	37000	90	1 A	5200	p 45
HQI-TS 1000/D/S	9.6	1065	85	2	90000	90	1 A	5900	p 15/s 15
HQI-TS 1000/NDL/S	9.6	1065	85	2	90000	90	1 B	4400	p 15
HQI-TS 2000/D/S ⁶⁾	11.3 ⁷⁾	2030	60	2/3	200000	100	1 A	5900	p 15
HQI-TS 2000/D/S/V ⁶⁾	11.3 ⁷⁾	2030	60	2/3	200000	100	1 A	5900	s 15
HQI-TS 2000/N/L ⁹⁾	9.8	2070	37	2/3	200000	102	2 B	4700	p 15
HQI-TS 2000/N/L ⁸⁾	10.3	2230	60	2/3	230000	110	2 B	4400	p 15
HQI-TS 2000/NDL/S	11.3	2030	60	2/3	200000	102	1 B	4400	p 15
HQI-TS 2000/NDL/S/V	11.3	2030	60	2/3	200000	102	1 B	4400	s 15
HQI-TS 1000/D, HQI-TS 2000/D and HQI-TS 3500/D have been discontinued									
HQL 50	0.6	59	7	1	1800	36	3	4200	universal
HQL 50 DE LUXE	0.6	59	7	1	2000	40	3	3400	universal
HQL 50 SUPER DE LUXE	0.6	59	7	1	1600	32	2 B	3200	universal
HQL 50 4Y	0.6	59	7	1	2000	40	3	3400	universal
HQL 80	0.8	89	8	1	3800	48	3	4200	universal
HQL 80 DE LUXE	0.8	89	8	1	4000	50	3	3400	universal
HQL 80 SUPER DE LUXE	0.8	89	8	1	3400	43	2 B	3200	universal
HQL 80 4Y	0.8	89	8	1	4000	50	3	3400	universal
HQL 125	1.15	137	10	1	6300	50	3	4200	universal
HQL 125 DE LUXE	1.15	137	10	1	6800	54	3	3400	universal
HQL 125 SUPER DE LUXE	1.15	137	10	1	5700	46	2 B	3200	universal
HQL 125 4Y	1.15	137	10	1	6800	54	3	3400	universal
HQL 250	2.15	266	18	1	13000	52	3	4000	universal
HQL 250 DE LUXE	2.15	266	18	1	14000	56	3	3400	universal
HQL 400	3.25	425	25	1	22000	55	3	4000	universal
HQL 400 DE LUXE	3.25	425	25	1	24000	60	3	3000	universal
HQL 700	5.4	735	40	1	40000	60	3	4000	universal
HQL 1000	7.5	1045	60	1	57000	57	3	4000	universal
HQL-B 50 SUPER DE LUXE	0.6	59	7	1	1600	32	2 B	3200	universal
HQL-B 80 SUPER DE LUXE	0.8	89	8	1	3000	38	2 B	3200	universal
HQL-R 80 DE LUXE	0.8	89	8	1	3000 ⁴⁾	38	3	3400	hs 45
HWL 160 225 V	0.8	160 ⁵⁾	—	—	3100	19	2 B	3600	hs 30
HWL 160 235 V	0.8	160 ⁵⁾	—	—	3100	19	2 B	3600	hs 30
HWL 250 225 V	1.2	250 ⁵⁾	—	—	5600	22	2 B	3800	hs 45
HWL 250 235 V	1.2	250 ⁵⁾	—	—	5600	22	2 B	3800	hs 45
HWL 500 225 V	2.4	500 ⁵⁾	—	—	14000	28	2 B	4100	hs 45
HWL 500 235 V	2.3	500 ⁵⁾	—	—	14000	28	2 B	4100	hs 45
HWL-R 160 DE LUXE	0.8	160 ⁵⁾	—	—	2500 ⁴⁾	16	2 A	3200	hs 15
NAV-E 110 ^{14) 16)}	1.3	125	10	1	8000	73	4	2000	universal
NAV-E 210 ^{14) 16)}	2.25	232	18	1	18000	86	4	2000	universal
NAV-E 350 ^{14) 16)}	3.6	385	25	1	34000	97	4	2000	universal
NAV-E 50/I ^{14) 10)}	0.77	62	10	1	3500	70	4	2000	universal

1) Typical value at rated voltage and $\cos \varphi \geq 0.9$

2) For circuit diagrams see page 5.44

3) For examples see page 5.45

4) See luminous intensity distribution curve on page 5.44

5) No control gear required

6) Lamps may be operated only on 10.3 A chokes

7) Lamp current measured at a 10.3 A choke

8) With 10.3 A control gear

9) With 8.8 A control gear

10) Operate only with NAV® control gear

11) For the advantages of operation with POWERTRONIC® see Section 11

12) With HQL® control gear

13) Operate with NAV® control gear

14) No igniter required

15) Specially developed for 230 V control gear. Excellent luminous flux behaviour: 190,000 lumen after 4000 hours of operation

16) Operate only with HQL control gear

Product reference	Lamp current A	Approx. system power with control gear W	PFC capacitor at 50 Hz $\mu F^{(1)}$	Circuit diagram no. ⁽²⁾	Luminous flux lm	Luminous efficacy of lamp lm/W	Colour rendering group	Colour temperature K	Burning position ⁽³⁾
NAV-E 50/I 4Y ^(4) 9)	0.77	62	10	1	3500	70	4	2000	universal
NAV-E 70/I ^(4) 9)	0.98	83	12	1	5600	80	4	2000	universal
NAV-E 70/I 4Y ^(4) 9)	0.98	83	12	1	5600	80	4	2000	universal
NAV-E 50 4Y	0.77	62	10	2	3500	70	4	2000	universal
NAV-E 50/E	0.77	62	10	2	3500	70	4	2000	universal
NAV-E 70 4Y	0.98	83	12	2	5600	80	4	2000	universal
NAV-E 70/E	0.98	83	12	2	5600	80	4	2000	universal
NAV-E 100	1.2	115	12	2	8500	85	4	2000	universal
NAV-E 100 SUPER 4Y	1.2	115	12	2	10200	102	4	2000	universal
NAV-E 150	1.8	170	20	2	14500	97	4	2000	universal
NAV-E 150 4Y	1.8	170	20	2	14500	97	4	2000	universal
NAV-E 150 SUPER 4Y	1.8	176	20	2	17000	113	4	2000	universal
NAV-E 250	3.0	275	32	2	27000	108	4	2000	universal
NAV-E 250 4Y	3.0	275	32	2	27000	108	4	2000	universal
NAV-E 250 SUPER 4Y	3.0	285	32	2	31100	124	4	2000	universal
NAV-E 400	4.45	440	45	2	48000	120	4	2000	universal
NAV-E 400 4Y	4.45	440	45	2	48000	120	4	2000	universal
NAV-E 400 SUPER 4Y	4.4	450	45	2	55500	139	4	2000	universal
NAV-E 1000	10.3	1075	100	2	120000	120	4	2000	universal
NAV-T 50 SUPER 4Y	0.8	66	10	2	4400	88	4	2000	universal
NAV-T 70	1.0	83	12	2	6000	86	4	2000	universal
NAV-T 70 4Y	1.0	83	12	2	6000	86	4	2000	universal
NAV-T 70 SUPER 4Y	1.0	83	12	2	6600	94	4	2000	universal
NAV-T 100	1.2	115	12	2	9000	90	4	2000	universal
NAV-T 100 SUPER 4Y	1.2	115	12	2	10700	107	4	2000	universal
NAV-T 150	1.8	170	20	2	15000	100	4	2000	universal
NAV-T 150 4Y	1.8	170	20	2	15000	100	4	2000	universal
NAV-T 150 SUPER 4Y	1.8	176	20	2	17500	116	4	2000	universal
NAV-T 250	3.0	275	32	2	28000	112	4	2000	universal
NAV-T 250 4Y	3.0	275	32	2	28000	112	4	2000	universal
NAV-T 250 SUPER 4Y	3.0	285	32	2	33200	133	4	2000	universal
NAV-T 400	4.4	440	45	2	48000	120	4	2000	universal
NAV-T 400 4Y	4.4	440	45	2	48000	120	4	2000	universal
NAV-T 400 SUPER 4Y	4.4	450	45	2	56500	141	4	2000	universal
NAV-T 600 SUPER 4Y	6.2	645	65	2	90000	150	4	2000	universal
NAV-T 1000	10.3	1075	100	2	130000	130	4	2000	universal
NAV-TS 70 SUPER 4Y	1.0	83	12	2	6800	97	4	2000	p 45
NAV-TS 150 SUPER 4Y	1.8	170	20	2	15000	100	4	2000	p 45
NAV-TS 250	3.0	275	36	2	25500	102	4	2000	p 45
NAV-TS 400	4.4	440	45	2	48000	120	4	2000	p 45
SOX 18	0.35	25 ⁽⁵⁾ /25 ⁽⁶⁾	5	4/5/6	1800 ⁽⁷⁾	100 ⁽⁷⁾	—	—	h 150
SOX 35	0.6	66 ⁽⁵⁾ /50 ⁽⁶⁾	20	4/5/6	4600 ⁽⁷⁾	131 ⁽⁷⁾	—	—	h 110
SOX 55	0.59	82 ⁽⁵⁾ /69 ⁽⁶⁾	20	4/5/6	8100 ⁽⁷⁾	147 ⁽⁷⁾	—	—	h 110
SOX 90	0.94	125 ⁽⁵⁾ /105 ⁽⁶⁾	26	4/5/6	13500 ⁽⁷⁾	150 ⁽⁷⁾	—	—	p 20
SOX 135	0.95	175 ⁽⁵⁾ /159 ⁽⁶⁾	45	4/5/6	22500 ⁽⁷⁾	167 ⁽⁷⁾	—	—	p 20
SOX 180	0.9	225 ⁽⁵⁾	40	4/5/6	32000 ⁽⁷⁾	177 ⁽⁷⁾	—	—	p 20
SOX-E 26	0.45	61 ⁽⁵⁾ /37 ⁽⁶⁾	6	4/5/6	3500 ⁽⁷⁾	134 ⁽⁷⁾	—	—	h 110
SOX-E 36	0.35	68 ⁽⁵⁾ /48 ⁽⁶⁾	4.4	4/5/6	5750 ⁽⁷⁾	160 ⁽⁷⁾	—	—	h 110
SOX-E 66	0.62	109 ⁽⁵⁾ /84 ⁽⁶⁾	7.6	4/5/6	10700 ⁽⁷⁾	162 ⁽⁷⁾	—	—	p 20
SOX-E 91	0.62	134 ⁽⁵⁾ /107 ⁽⁶⁾	5.2	4/5/6	17000 ⁽⁷⁾	187 ⁽⁷⁾	—	—	p 20
SOX-E 131	0.62	172 ⁽⁵⁾ /148 ⁽⁶⁾	3.4	4/5/6	25000 ⁽⁷⁾	190 ⁽⁷⁾	—	—	p 20

1) Typical value at rated voltage and $\cos \varphi \geq 0.9$

2) For circuit diagrams see page 5.44

3) For examples see page 5.45

4) No igniter required

5) System wattage: lamp + high-reactance transformer

6) System wattage: lamp + hybrid control gear

7) Values resulting from operating the lamp with a high-reactance transformer

8) See luminous intensity distribution curve on page 5.44

9) Operate only with NAV[®] control gear



Operating instructions

Supply voltage

The lamps must be connected via appropriate control gear.

A 230 V/50 Hz ac supply is generally required. HQI® 2000 W lamps are designed for 400 V/50 Hz (except HQI®-T 2000/N/230 V). If a different supply voltage is used, control gear with appropriate taps designed for these voltages must be used.

Permitted mains voltage deviation:

For HQL® ± 10%, all others ± 3%.

Sudden fluctuations in mains voltage of more than ± 10% may cause the lamps to go out. If the deviation from rated supply voltage (230 V or 400 V) is permanent, high-pressure discharge lamps may exhibit changes in chromaticity and luminous flux. Lamp life may also be reduced.

Safety

OSRAM high-pressure lamps meets the safety requirements defined in IEC 62035.

The following lamps are UV-reduced:

HQI®/HCL® ≤ 400 W

Because of their high operating pressure the following lamps may only be used in fully enclosed luminaires designed to take them. In the rare case that a discharge vessel shatters, the luminaire must be able to retain all the hot pieces of ceramic or glass throughout their life.

This relates to the following lamps:

- All HCL®-TS and HQI®-TS lamps
- All HCL®-T and HQI®-T lamps
- All HCL®-TT lamps
- All HCL®-TC lamps
- All HCL®-TF lamps
- All HCL®-E ≥ 250 W and HQI®-E ≥ 250 W lamps
- HQI®-R 150 W/NDL lamps
- All HCL®-TM lamps

Operating lamps with a damaged outer bulb is dangerous and therefore not permitted. Exception: HQI®-TS ... without an outer bulb.

At the end of their lives, sodium high-pressure lamps and metal halide lamp exhibit a "rectification" effect. This is not a manufacturer-specific effect. Because of the excessive DC components, the control gear (ballasts, transformers and/or starters) may be overloaded. To meet the requirements of IEC 62035 therefore, suitable protective measures must be taken to ensure that safety is maintained under these conditions. This applies also to control gear with the option of power reduction. NAV PLUG-IN lamps have been developed specially as substitutes for mercury vapour lamps in existing luminaires and are therefore not affected.

The chokes and pf correction capacitors generally needed for operating discharge lamps may, under certain conditions, create oscillating circuits. These circuits may then produce excessive currents and voltages, which in turn can destroy the lamps, ballasts and capacitors. Such resonance phenomena must be avoided by appropriate circuits and fuses.

Lamp operation

Operating high-pressure lamps for short periods in combination with frequent on/off switching will shorten their life. This applies to both cold starting and hot restarts. The lamps should be operated for at least 3 hours and should remain off for at least 30 minutes. This applies in particular to HQI® ≥ 1000 W. In low-temperature applications down to -50 °C only HCL®, HQI® and NAV® lamps are suitable for operation with an external igniter. Such applications call for special (heatable) igniters such as MZN 400 SU-LT from BAG Turgi (for lamps from 100 to 400 W). The following lamps are suitable for open luminaires:

- All HQI®-E 70 W to 150 W lamps
- All HQI®-E/P lamps
- All HCL®-E/P, HCL®-PAR, HCL®-R111 and HCL®-T/P lamps

The use of shields should still be considered for safety reasons in each case.

Luminaire design

Luminaires must comply with the EN 60598 standard design (thermal characteristics and fuse protection).

HQI® 1000 W to 3500 W lamps should be held without pressure or by means of a lamp support close to the crown end. The same applies to NAV®-T 1000 W lamps in the horizontal burning position.

Control gear

HWL®:

No control gear required; connect directly to supply. HCL®, HQI®, HQL®, NAV®:

- Control gear:
 - < 220 V high-reactance transformer,
 - ≥ 220 V choke.

For HQI®, HCL® and NAV® lamps, control gear with suitable overload protection should be used (see Safety).

- Igniters: HCL®, HQI® and NAV® lamps also need an appropriate igniter. (Exceptions: HQI®-T 2000/N, HQI®-T 2000/D/I, NAV®-E 50/I 4Y®, NAV®-E 70/I 4Y®, NAV®-E 50/I, NAV®-E 70/I, NAV®-E 110, NAV®-E 210, NAV®-E 350).

NAV® SUPER lamps require igniters with a higher ignition energy.

With suitable igniters or control gear HQI®-TS and NAV®-TS lamps can be instantly restarted while hot (except HQI®-TS 2000/N/L).

SOX, SOX-E:

Operation with high-reactance transformers (except SOX 18 tapped choke and 5 µF ignition capacitor) or hybrid control gear.

For the distances between the lamp and the control gear, check the information provided by the equipment manufacturer.

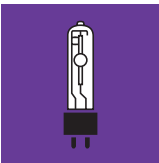
Start-up current

HCL®, HQI®, HQL®, NAV®:

Depending on the control gear used, the start-up current may be up to twice as high as the operating current.

Circuit protection

Fuses for HCL®, HQI® and NAV® lamps must be slow-acting. If fuse-wire is used it should be rated for twice the rated lamp current. If MCBs are provided they should comply with characteristic "C".



Holders

The holders used must be capable of withstanding the high voltages that occur during ignition and hot restarts. Suitable high-voltage holders can be ordered from lampholder manufacturers.

Power factors

(without correction)

- HWL®: $\cos \varphi \sim 1$
- HCl®, HQI® and HQL®: $\cos \varphi$ 0.5 to 0.7
- NAV®: With chokes $\cos \varphi$ 0.5
- SOX, SOX-E: $\cos \varphi \sim 0.3$ (SOX 18: $\cos \varphi \sim 0.9$)

For the PFC capacitors required check the manufacturer's specifications. For examples see pages 5.34 to 5.39.

Wattage reduction

HQI® lamps must not be operated at reduced wattage as this may result in colour shifts, poorer maintenance and shorter lamp life.

Dimming HCl® lamps

The higher thermal load capacity of the round ceramic burner offers better dimming behaviour in terms of luminous efficacy and colour rendering compared to metal halide lamps with quartz burners or standard cylindrical ceramic burners. As before, however, dimming does lead to a change in the chromaticity coordinates. Lamps operated at dimmed settings suffer a greater loss of luminous flux and a greater colour shift over their lifetime. The method of dimming has a strong influence on the results. It is advisable to reduce the lamp power with a controllable square-wave ECG; dimming should not be achieved by reducing the voltage or by leading-edge phase dimming. The warranted product characteristics cannot be guaranteed for lamps that are operated at dimmed settings.

HQL® and NAV® lamps can be operated at up to 50% lower wattage by changing the impedance, provided ignition takes place at rated wattage.

Lamp start

HWL®: Instant full luminous flux. Starting current approx. 30% higher.

HQL®: Full luminous flux after approx. 5 minutes. Starting current approx. 40% higher.

HCl®: Full luminous flux after approx. 2 to 4 minutes. Starting current approx. 40% to 90% higher – depending on lamp type and control gear.

HQI®: Full luminous flux after approx. 2 to 4 minutes. Starting current approx. 40% to 90% higher – depending on lamp type and control gear.

NAV®: Full luminous flux after approx. 6 to 10 minutes depending on lamp type and control gear. Starting current approx. 25% higher.

SOX,

SOX-E: Full luminous flux after approx. 12 to 15 minutes. Or longer at low ambient temperatures. No higher starting current.

Restart

HCl®, HQI®, HQL®, HWL®, NAV®:

These lamps need a little time (0.25 to 15 minutes) to cool down before they can be restarted because the ignition voltage to begin with would be higher than the supply voltage or, in the case of HCl®, HQI® and NAV®, above the ignition voltage of the igniter.

For POWERSTAR® HQI®-TS ≤ 1000 W, HQI®-TS 2000/D/S and VIALOX® NAV®-TS lamps, instant restarting is possible with suitable igniters.

The necessary restrike voltage is 25 to 60 kVs.

SOX, SOX-E:

SOX 18 lamps can be instantly restarted. All other SOX lamps need a cooling time of a few minutes before they can be restarted.

Radio interference

After ignition, radio interference does not normally occur with high pressure lamps. Should radio interference occur with HQL® lamps it can be avoided by connecting a low induction capacitor of 0.1 μ F parallel to the lamp. Capacitors must not be connected parallel to any other high-pressure lamp.

Photometric and electrical data

All lamp-specific electrical and photometric data is measured after 100 hours of operation under laboratory conditions on reference equipment. Unless otherwise indicated, the specified values for HQI® ≥ 1000 W apply to the horizontal burning position for -T and -TS types and for the base-up burning position for -E types. NAV® lamps are all measured in the horizontal burning position, and HQ and HW lamps in the base-up position. In other burning positions there may be considerable differences in the measured values, particularly the luminous flux, colour temperature and life.

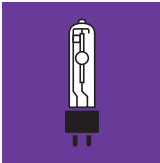
With the exception of SOX, the luminous flux is virtually unaffected by the ambient temperature outside the luminaire. At low ambient temperatures down to around -50 °C special igniters are needed. All POWERBALL® HCl®-TS ..., POWERSTAR® HQI®-TS ... and VIALOX® NAV®-TS ... lamps achieve their rated data at relatively high ambient temperatures, such as those in typical luminaires or luminaire simulators.

Detailed information on thermal protection tubes (luminaire simulators) for determining lamp data for HQI®-TS and HCl®-TS can be found in IEC 61167, Section 1.7.

NAV®-TS ... lamps should be treated similarly.

Colour shift

HQI® and HCl® lamps may show colour shifts from lamp to lamp. These shifts may be due to external influences such as mains voltage, control gear, burning position or luminaire design.



Operating instructions

End of service life

High pressure discharge lamps (HCl[®], HQL[®], NAV[®] and HQL[®]) can be considered to have reached the end of their service life if:

- there is a marked change in their colour or
- there is a significant loss of brightness or
- the lamp no longer ignites or
- the lamp periodically goes out and comes on again.

To protect the control gear and to avoid unnecessary radio interference, HCl[®], HQL[®], NAV[®] and HQL[®] lamps must be replaced as soon as they reach the end of their service life.

Warranty

High-pressure discharge lamps are only guaranteed if all operating conditions are observed; in other words, if the maximum permissible lamp temperatures are not exceeded and the lamps are operated only with control gear that has been approved or declared as suitable.



System + guarantee for HCI/HQI and PTi/PTU

Lamps	HCI-T 35, 70, 150 W HCI-TS 70, 150 W HCI-TC 35, 70 W HQI-T 70, 150 W HQI-TS 70, 150 W	1-year guarantee for up to 4000 hours for initial equipment IEC switching cycle	
ECG	PTi 35 S, I PTi 70 S, I PTU 35, 35 L PTU 70 PTU 150	5-year guarantee	

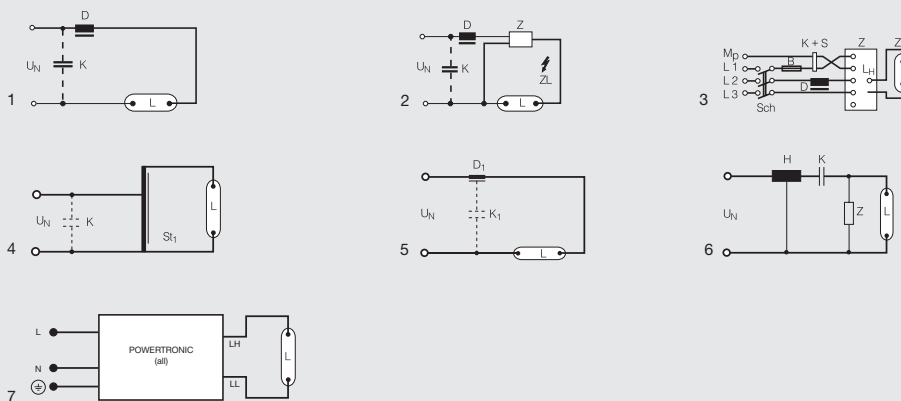
- At least 25 fittings
- Operation at 100% output, not at reduced power
- Not for outdoor applications
- For more information on the system guarantee and the terms and conditions of the guarantee go to www.osram.com/system-guarantee
- Registration required:
www.osram.de/systemgarantie – www.osram.com/system-guarantee



Circuit diagrams

Luminous intensity distribution of reflector lamps

These **circuit diagrams** refer to the lamps listed on pages 5.34 to 5.39



B = 6 A fuse,
slow acting
D = Choke
D₁ = Tapped choke
K = PFC capacitor
K₁ = PFC and ignition
capacitor 5 µF
K+S = Time-limiting
switch and
contactor
L = Lamp
L_H = High-voltage
terminal
Mp = Neutral
conductor

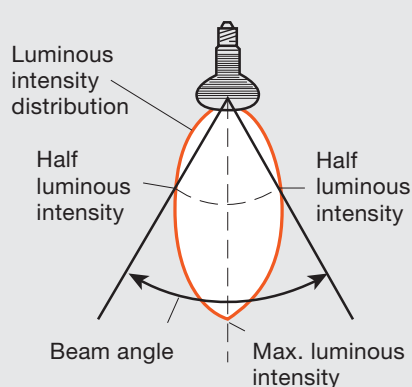
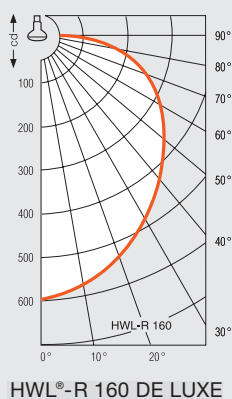
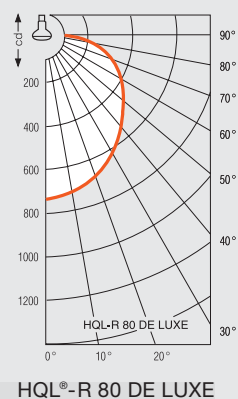
H = Hybrid control
gear
Sch = Switch
St = High-reactance
transformer
U_N = 230 V ac
mains voltage
(for 2000 W and
3500 W = 400 V
ac)
Z = Igniter to be
installed near
the lamp
ZL = HF igniter lead to
contact plate of
lamp

For single phase supplies the choke must be connected to the live lead.

For reliable ignition the igniter approved for the lamp type must be used. For POWERTRONIC® electronic control gear for HCL®, HQL® and NAV® high-pressure lamps see Section 11.

Chokes, lampholders, capacitors, high-reactance transformers and igniters are available from electrical suppliers.

Luminous intensity distribution of reflector lamps



The beam angle for axially symmetrical light distribution is the angle through the points where the luminous intensity is half of its maximum value.

Lamp reference	Beam angle	Maximum illuminance (lux) at a distance from the lamp of		
		1.5 m	2.5 m	3.5 m
HQL-R 80 DE LUXE	120°	330	120	60
HWL-R 160 DE LUXE	120°	265	95	50

Light colours and colour rendering to DIN 5035

Burning positions

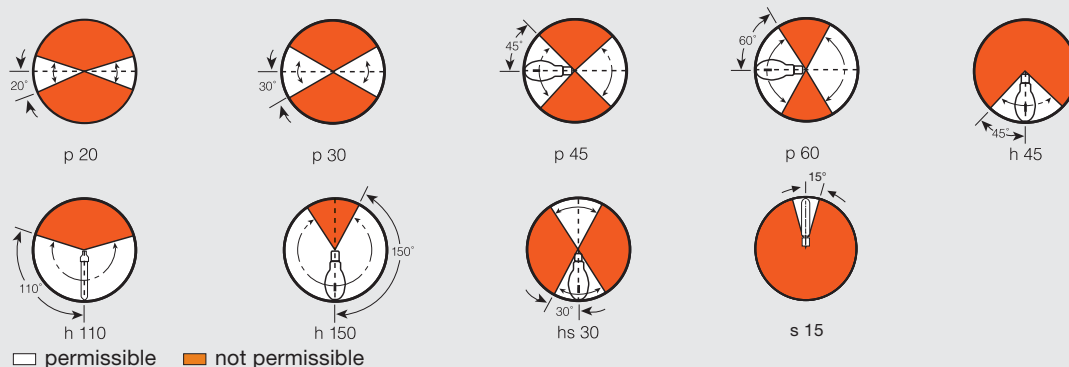
Bases

Light colours

Colour rendering index (R_a)		Light colour above 5000 K	Light colour around 4000 K	Light colour below 3400 K
Group 1 very good	1 A	POWERSTAR® HQI®/D	POWERBALL® HCl®/942/NDL	POWERBALL® 930/WDL
	R_a 90-100			
	1 B		POWERSTAR® HQI®/NDL	POWERSTAR® HQI®/WDL
	R_a 80-89			POWERBALL® HCl®/830/WDL
Group 2 good	2 A			
	R_a 70-79			
	2 B		POWERSTAR® HQI®/N	HQL® SUPER DE LUXE
	R_a 60-69		HWL®	
Group 3 acceptable	R_a 40-59		HQL®	HQL® DE LUXE
Group 4	R_a 20-39			VIALOX® NAV®
				VIALOX® NAV® 4Y®
				VIALOX® NAV® SUPER 4Y®

For details of colour temperature see pages 5.34 to 5.39

Burning positions



Bases IEC/EN 60061-1

