

POWERSTAR[®] HQI-T[®]

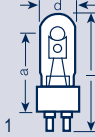
Technical Information

SEE THE WORLD IN A NEW LIGHT

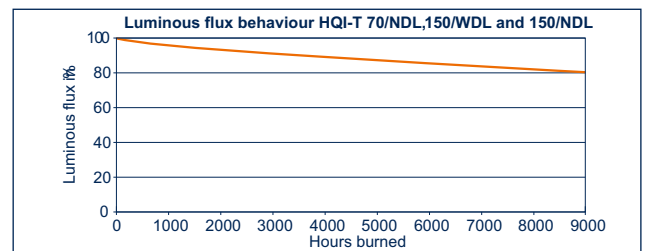
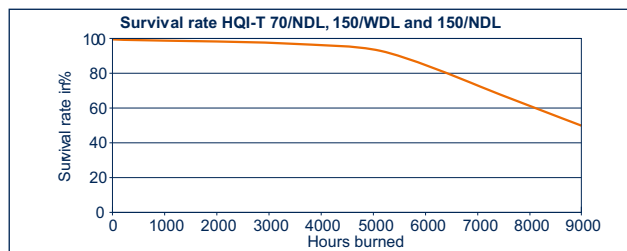
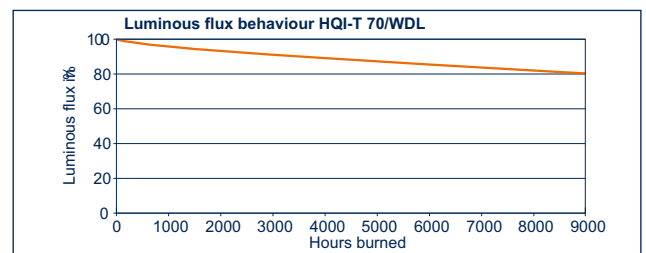
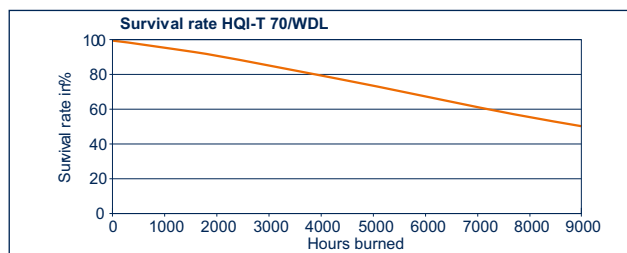
OSRAM



POWERSTAR® HQI-T®



		HQI-T 70 W WDL	HQI-T 70 W NDL	HQI-T 150 W WDL	HQI-T 150 W NDL
Lamp reference		HQI-T 70W/WDL	HQI-T 70W/NDL	HQI-T 150W/WDL	HQI-T 150W/NDL
Nominal luminous flux	lm	5300	5800	13000	13000
Luminous efficacy	lm/W	71	77	87	87
Light colour/Colour appearance		WDL	NDL	WDL	NDL
Colour temperature	K	3000	4200	3000	4200
Colour rendering index	R _a	76	84	77	85
Lamp wattage	W	75	75	150	150
Lamp voltage	V	95	100	100	100
Lamp current	A	1	1	1.8	1.8
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5
Base		G12	G12	G12	G12
Diameter d	mm	25	25	25	25
Length max. l	mm	84	84	84	84
LCL a	mm	56	56	56	56
Burning position		universal	universal	universal	universal
Average lamp life	h	9000	9000	9000	9000
Max. perm. outer bulb temp.	°C	500	500	550	550
Max. perm. pinch temp.	°C	280	280	280	280
PF corr. cap. at 50 Hz	µF	12	12	20	20
EAN		4050300412993	4050300488424	4050300873664	4050300488448
Standard pack	Qty	12	12	12	12
Figure	No.	1	1	1	1
Circuit (see page 22)	Fig. no.	2/5	2/5	2/5	2/5
ILCOS		MT/UB-70/30/ 2A-H-G12-25/84	MT/UB-70/42/ 1B-H-G12-25/84	MT/UB-150/30/ 2A-H-G12-25/84	MT/UB-150/42/ 1B-H-G12-25/84



Fusing:

HQI[®] lamps must be protected by slow acting fuses. If fuse wire is used it is sufficient for it to be rated at twice the rated current of the lamp. If automatic cutouts are used they should have characteristic "C". If adjusted to the upper limit value of 10 x rated current there will be no triggering if fuse protection is at twice the rated lamp current.

Restarting:

The lamps will restart only after they have cooled down for 2 to 15 minutes.

Instant restarting with suitable igniters is possible for:

- c HQI-TS ≤ 400 W
- c HQI-TS 1000 W/D/S and 2000 W/D/S (short arc)
- c HQI-TS 2000 W/D/L (long arc)

The necessary surge voltage is 25 to 60 kVs.

Lampholders:

Because of the high voltages involved in ignition the lampholders must be designed for these high voltages. Lampholders that meet these requirements are available from appropriate manufacturers.

Power reduction:

Dimming metal halide lamps is not recommended.

OSRAM cannot provide a guarantee for dimmed lamps.

Dimming adversely affects colour rendering. The colour location shifts towards colder light colours and the colour spread increases. Dimmed lamps also tend to flicker. Luminous flux maintenance is significantly worse as a result of dimming. Dimming can shorten the life of the lamps.

End of life:

To protect the control gear and to avoid radio interference, high-pressure discharge lamps must be replaced as soon as they come to the end of their life.

These lamps reach their end of life when

- c the light colour of the lamp changes dramatically
- c there is a significant loss of brightness
- c the lamp no longer ignites
- c the lamp starts to cycle (periodically goes out and ignites again).

At end of lamp life the risk of a broken burner rises.

This phenomena is caused by effects not dependent on the manufacturer like the rectifying effect mentioned earlier. Because of this we strongly recommend to change the lamp latest after average lifetime has been reached or if one of the above mentioned effects are shown.

Notes on disposal:

All metal halide lamps contain small quantities of mercury. If they break, poisonous mercury vapour may be released. The lamps must be treated as waste requiring special supervision with EEC code **200121*** for waste or residue containing mercury and should be passed to a relevant collection or recycling company.

Guarantee:

A guarantee can only be made if suitable control gear is used and the defined operating conditions are met.

Safety:

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

All HQI lamps with outer bulb are of UV reduced design and comply with necessary limits (ACGIH < 2 mW/1000 lm).

Because of their high operating pressure all HQI-lamps may only be used in fully enclosed luminaires designed to take them:

- c All HQI[®]-TS
- c All HQI[®]-T
- c All HQI[®]-E ≥ 250 W

As we cannot completely rule out the possibility of the bulb bursting, luminaires for the lamps mentioned above must be equipped with sealed shatter-proof shields that can withstand wide fluctuations in temperature.

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

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.

Exceptions:

The following lamps are suitable for open luminaires:

- c All HQI[®]-E 0 W to 150 W
- c All HQI[®]-E/P

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

Luminaire design:

Luminaire design (thermal design and fuse protection) should be based on the EN 60598-1 standard.

HQI[®] 1000 W to 2000 W lamps should be held without pressure or by means of a lamp support close to the base-free end.

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 data relates to the horizontal burning position for T and TS types and to the base up burning position for E types. If different burning positions are used in actual practice there may be considerable changes in the lamp data, particularly with regard to luminous flux, colour temperature and lamp life. The luminous flux is virtually unaffected by the ambient temperature outside the luminaire. At low ambient temperatures down to around $-50\text{ }^{\circ}\text{C}$ special igniters are needed.

Detailed information on heat accumulation tubes (luminaire simulators) for determining lamp data for HQI and HCL [®]-TS is given in IEC 6116, clause 1.

Colour deviations:
With all metal halide lamps there may be differences in colour from one lamp to the next due to external factors such as mains voltage, type of control gear used, burning position and luminaire design.

Lamp life

There are a confusing number of definitions for lamp life, and these differ from one region to the next and from one application to the next. The basic definitions for the most common types are given below.

This document refers explicitly only to the average life

Average life:

Average number of hours burned over several groups in which in the group in question half the lamps have failed as the result of a defect (50% failure).

Minimum life:

Minimum period of time in which a lamp remains in operation under laboratory conditions.

Economical life:

Period of time between group relamping of an installation under the condition that operating costs are minimised and the installation luminous flux does not fall below a particular value. This will vary according to the application.

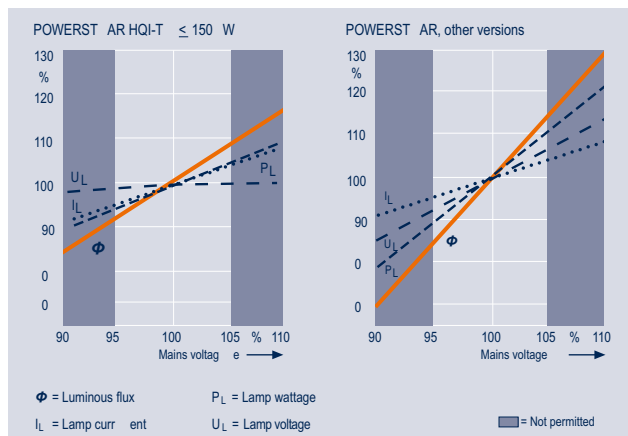
Survival rate:

Quantity of working lamps of a group of lamps after a defined number of burning hours. Average value of some groups.

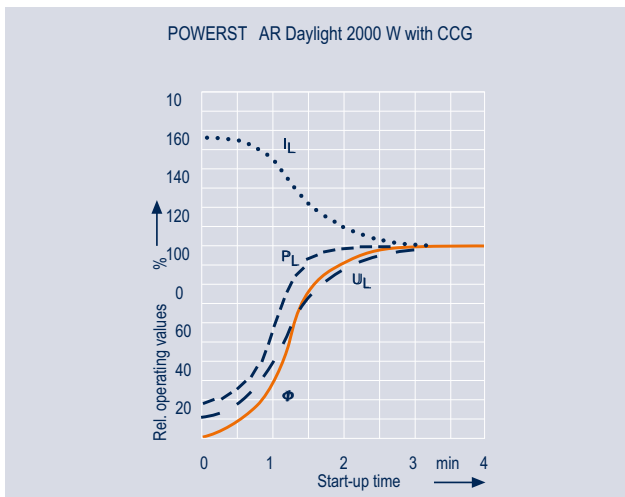
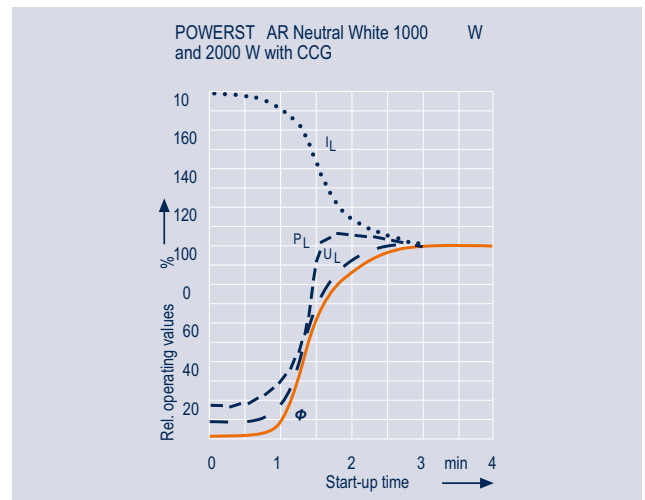
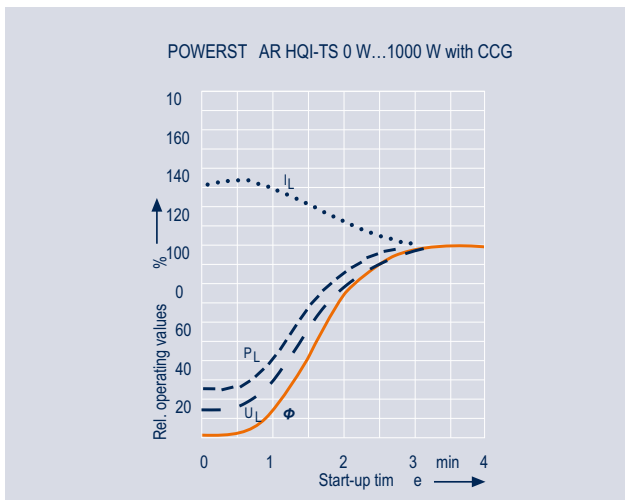
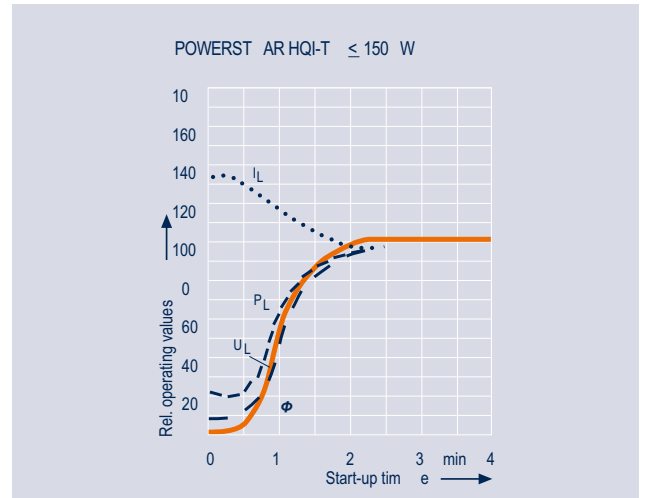
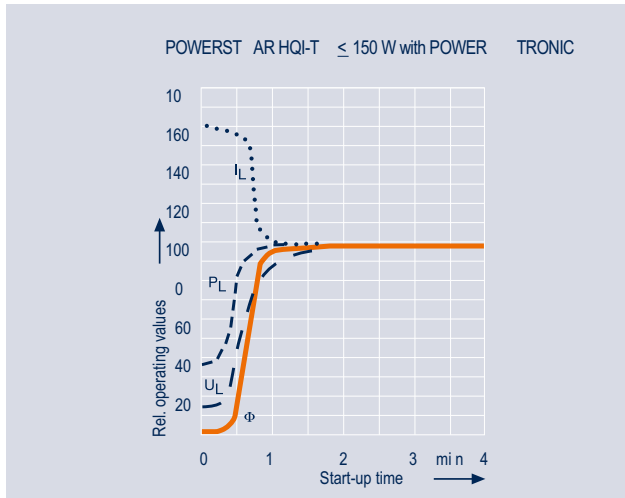
Service life:

Simplified practical view of the economical life. This is the operating time after which the installation luminous flux (the product of the relative luminous flux and the lamps still in operation) is still around 0% (sometimes 0%).

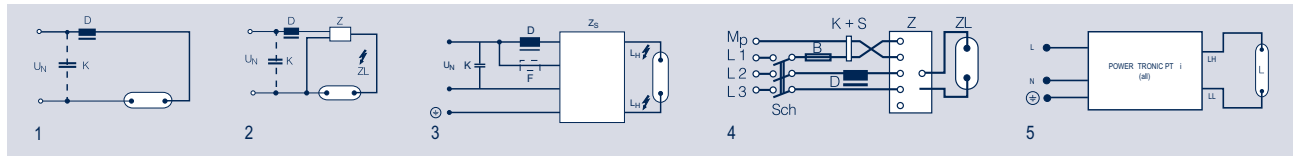
Operating characteristics in relation to the supply voltage



Start-up behaviour (average value)



Circuit diagrams



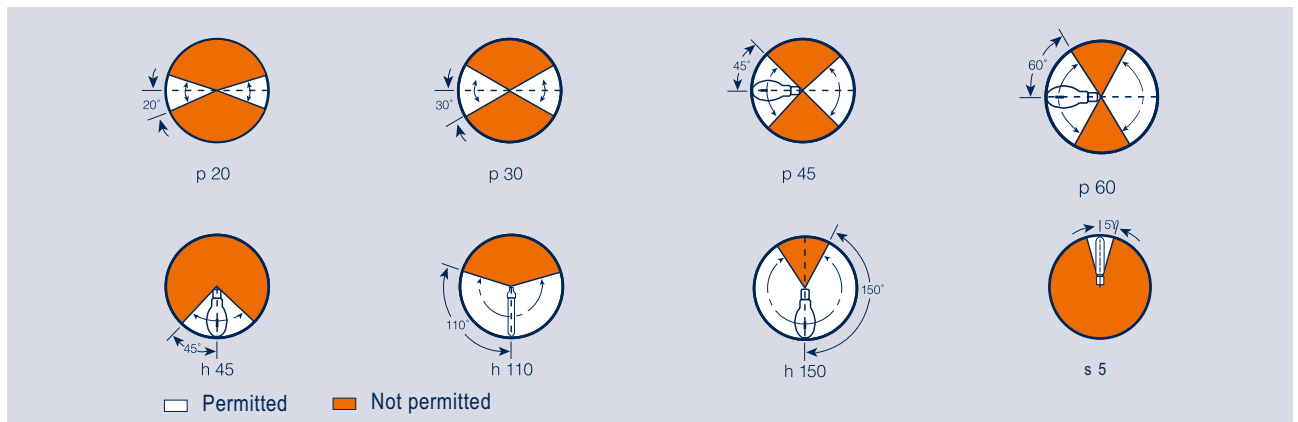
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|--|---|
| B = 6A fuse, slow acting | U_N = 230 V ac mains voltage (for 2000 W = 400 V ac) |
| D = Choke | Z = Igniter to be installed near the lamp |
| F = Protection on demand | ZL = HF igniter lead to contact plate of lamp |
| K = PF correction capacitor | Zs = Symmetrical hot restrike ignitor with automatic ignition |
| K+S = Time-limiting switch and contactor | |
| L = Lamp | |
| L _H = High-voltage terminal | |
| M _p = Neutral conductor | |
| Sch = Switch | |

For power supplies with a neutral conductor the choke should be connected to the live conductor.

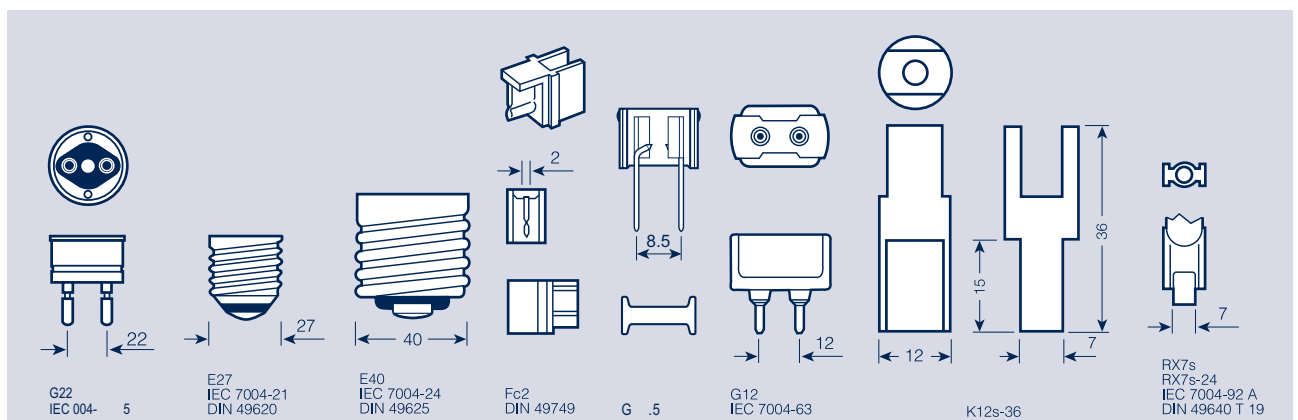
The right igniter for the particular lamp type must be used to ensure reliable and safe ignition.

Chokes, holder, capacitors and igniters are available from electrical suppliers.

Burning positions

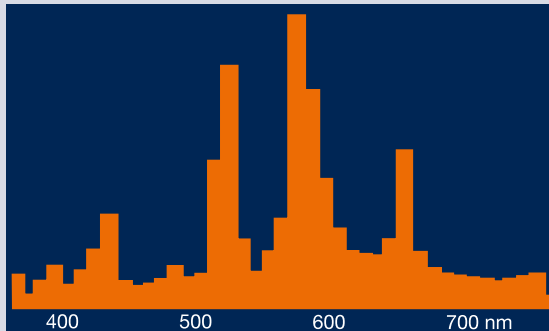


Base

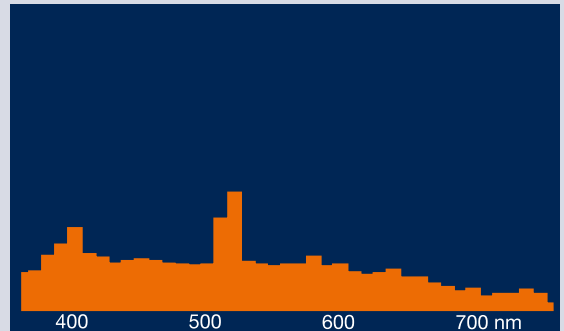


Spectral power distribution of discharge lamps

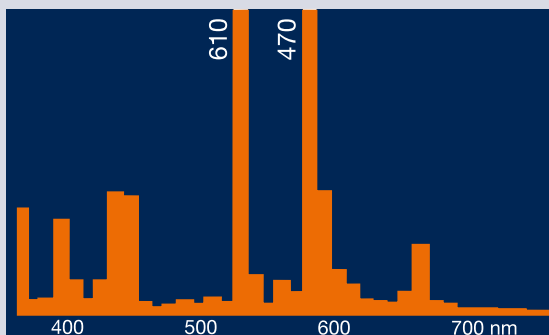
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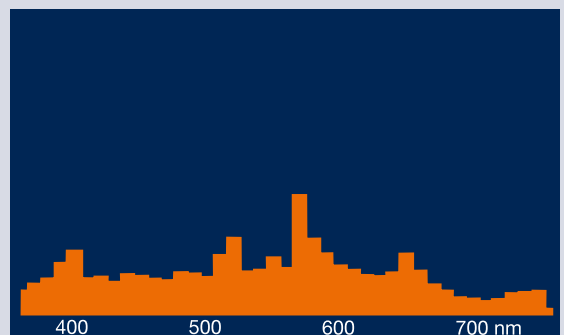
HQI® .../WDL



HQI® .../NDL



HQI® .../N



HQI® .../D

Visible range from 380 to 780 nm

Vertical scale $\frac{400 \text{ mW}}{1000 \text{ lm} \cdot 10 \text{ nm}}$