



POWERSTAR® HQI®

Technical Information

100
YEARS OF INNOVATION
OSRAM

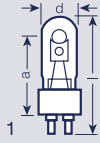
SEE THE WORLD IN A NEW LIGHT

OSRAM

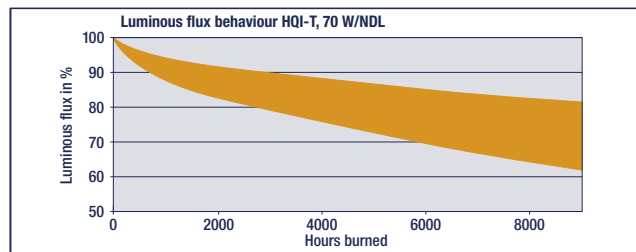
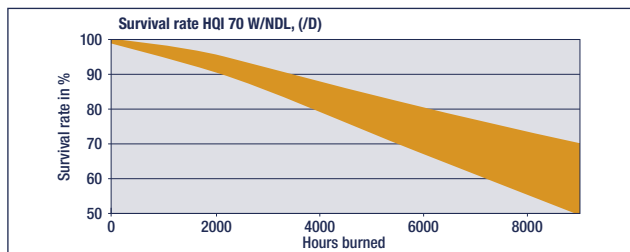
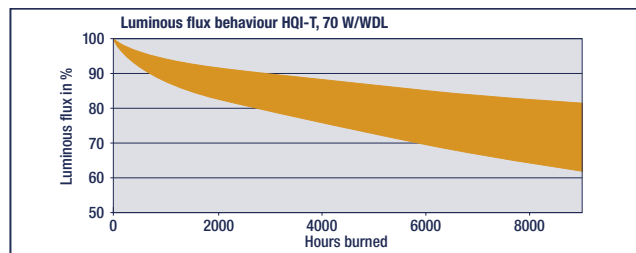
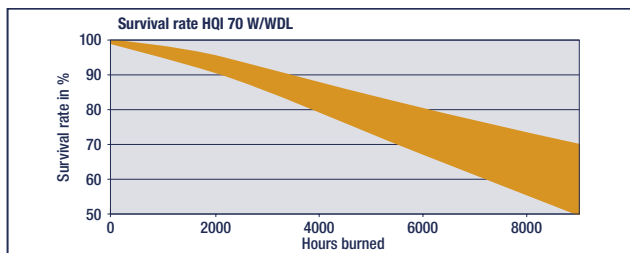


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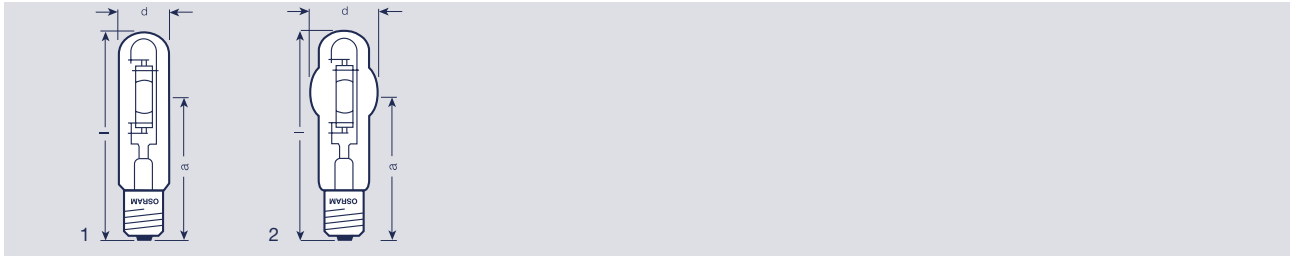
POWERSTAR® HQI®-T



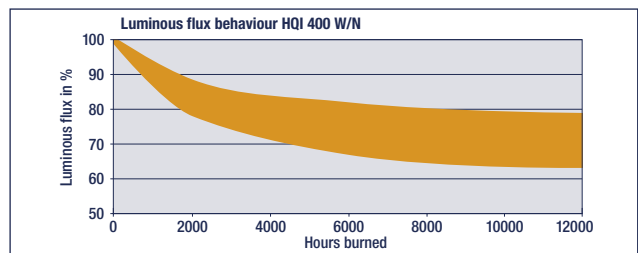
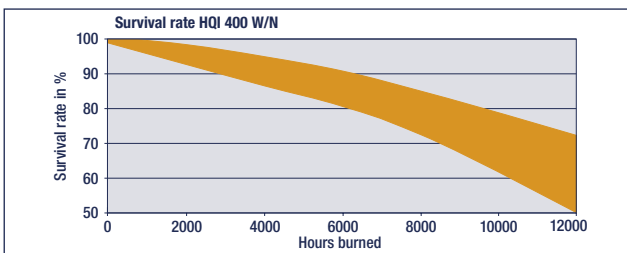
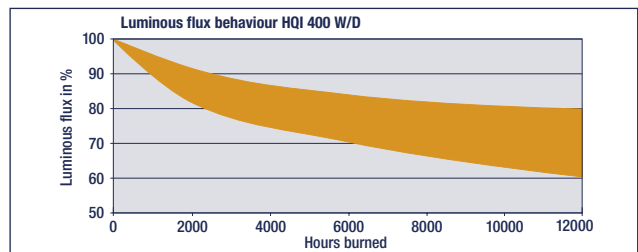
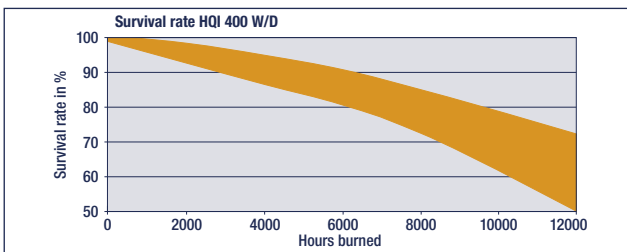
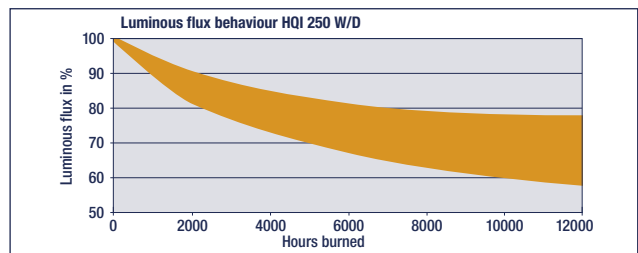
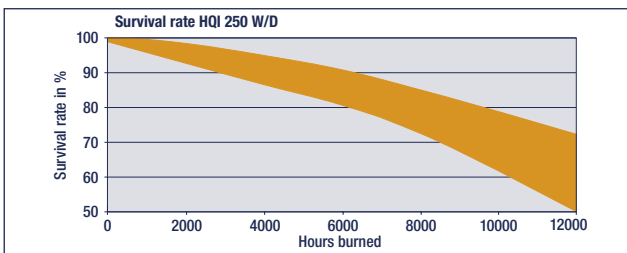
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Type		MT/UB-70/30/ 1B-H-G12-25/84	MT/UB-70/42/ 1B-H-G12-25/84	MT/UB-150/30/ 1B-H-G12-25/84	MT/UB-150/42/ 1B-H-G12-25/84
Lamp wattage	W	75	75	150	150
Lamp voltage	V	95	100	100	100
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5
Lamp current	A	1	1	1.8	1.8
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	Ra	76	84	77	85
NIOSH Skin	h	> 17.3	> 50	> 22	> 17
ACGIH UV output	mW/lm ² · 1000 lx	< 0.48	< 0.14	< 0.4	< 0.5
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
Lamp reference		HQI-T 70W/WDL	HQI-T 70W/NDL	HQI-T 150W/WDL	HQI-T 150W/NDL
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



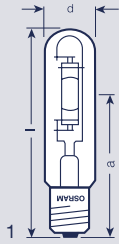
POWERSTAR® HQI®-T, BT



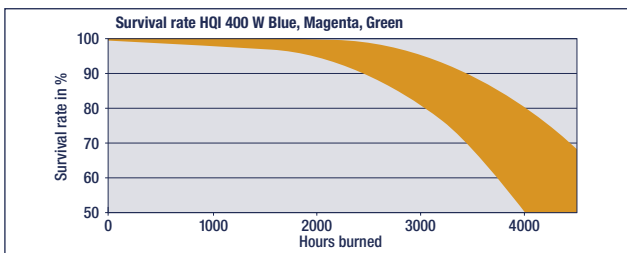
		HQI-T 250 W	HQI-BT 400 W	HQI-BT 400 W	HQI-T 400 W	HQI-T 400 W
		D	D	D	N	N
Type		UVS	UVS, NAV-VG	UVS, HQI-VG	UVS, NAV-VG	UVS, HQI-VG
ILCOS		MT/UB-250/53/ 1A-H-E40-46/225	MC/UB-400/52/ 1A-H-E40-62/285	MC/UB-400/59/ 1A-H-E40-62/285	MT/UB-400/35/ 2B-H-E40-46/273/P45	MT/UB-400/40/ 2B-H-E40-46/273/P45
Lamp wattage	W	250	420	360	430	380
Lamp voltage	V	100	120	120	120	120
Ignition voltage min./max.	kVs	3/5	3/5	3/5	3.6/5	3.6/5
Lamp current	A	3	4	3.5	4.0	3.6
Nominal gear current	A	–	4.6	3.5	4.6	3.5
Nominal luminous flux	lm	20000	35000	27000	42000	34000
Luminous efficacy	lm/W	82	83	75	98	89
Light colour/Colour appearance		D	D	D	N	N
Colour temperature	K	5200	5200	5900	3500	4000
Colour rendering index	R _a	90	90	90	> 65	> 60
NIOSH Skin	h	> 50	> 50	> 50	> 45	> 45
ACGIH UV output	mW/m ² · 1000 lx	< 0.08	< 0.06	< 0.06	< 0.19	< 0.19
Base		E40	E40	E40	E40	E40
Diameter d	mm	46	62	62	46	46
Length max. l	mm	225	285	285	275	275
LCL a	mm	150	175	175	175	175
Burning position		universal	universal	universal	p 45	p 45
Average lamp life	h	12000	12000	12000	12000	12000
Max. perm. outer bulb temp.	°C	500	500	500	500	500
Max. perm. base edge temp.	°C	250	250	250	250	250
PF corr. cap. at 50 Hz	µF	32	45	35	45	35
Lamp reference		HQI-T 250W/D	HQI-T 400W/D	HQI-T 400W/D	HQI-T 400W/N	HQI-T 400W/N
EAN		4050300015293	4050300468471	4050300468471	4050300324647	4050300324647
Standard pack	Qty	12	12	12	12	12
Figure	No.	1	2	2	1	1
Circuit (see page 22)	Fig. no.	2	2	2	2	2



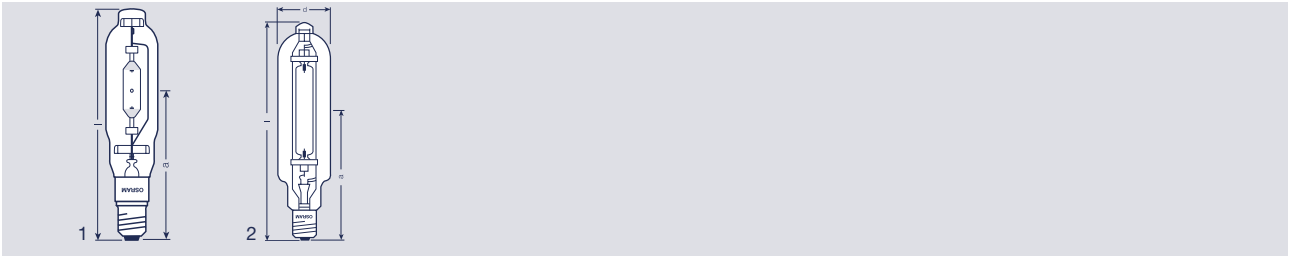
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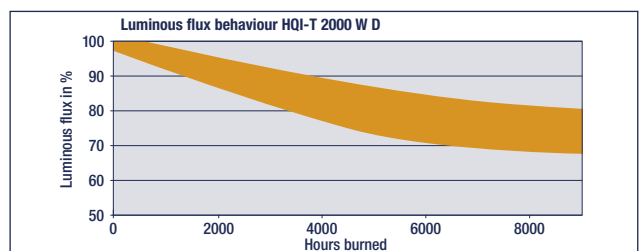
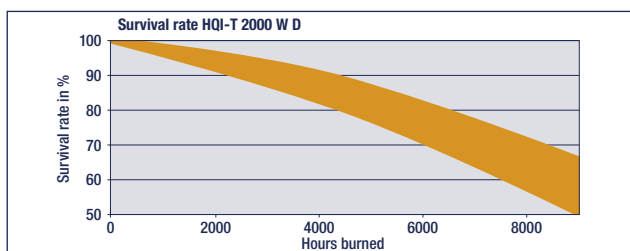
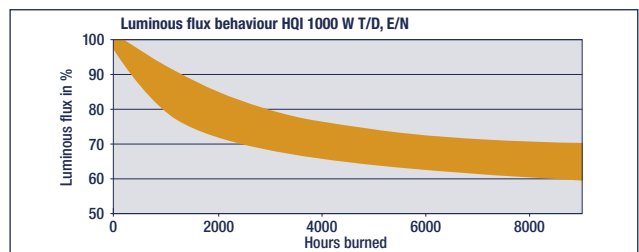
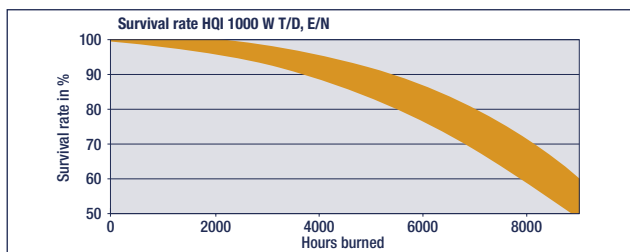
		HQI-T 400 W BLUE UVS	HQI-T 400 W GREEN UVS	HQI-T 400 W MAGENTA UVS
Type		MT-400/BLUE/ H-E40-46/260/P55	MT-400/GREEN/ H-E40-46/260/P55	MT-400/MAGENTA/ H-E40-46/275/P55
ILCOS				
Lamp wattage	W	360	360	440
Lamp voltage	V	120	120	120
Ignition voltage min./max.	kVs	3/5	3/5	4/5
Lamp current	A	3.6	3.6	4.2
Nominal gear current	A	3.5	3.5	4.6
Nominal luminous flux	lm	uncertain	uncertain	uncertain
Luminous efficacy	lm/W	uncertain	uncertain	uncertain
Light colour/Colour appearance		BLUE	GREEN	MAGENTA
Colour temperature	K	monochr.	monochr.	monochr.
Colour rendering index	R _a	–	–	–
NIOSH Skin	h	–	–	–
ACGIH UV output	mW/m ² · 1000 lx	–	–	–
Base		E40	E40	E40
Diameter d	mm	46	46	46
Length max. l	mm	275	275	275
LCL a	mm	175	175	175
Burning position		p 55	p 55	p 55
Average lamp life	h	–	–	–
Max. perm. outer bulb temp.	°C	500	500	500
Max. perm. base edge temp.	°C	250	250	250
PF corr. cap. at 50 Hz	µF	35	35	45
Lamp reference		HQI-T 400W BLUE	HQI-T 400W GREEN	HQI-T 400W MAGENTA
EAN		4050300575971	4050300575957	4050300649535
Standard pack	Qty	12	12	12
Figure	No.	1	1	1
Circuit (see page 22)	Fig. no.	2	2	2



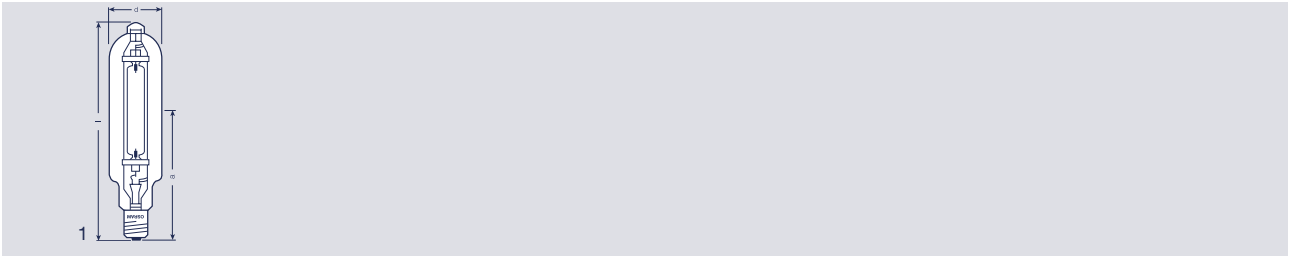
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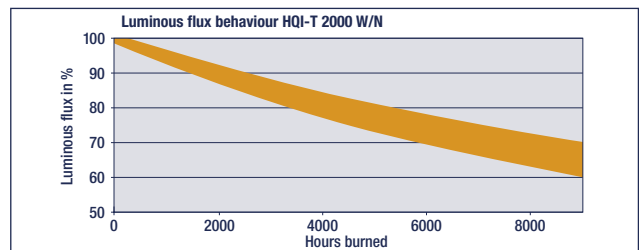
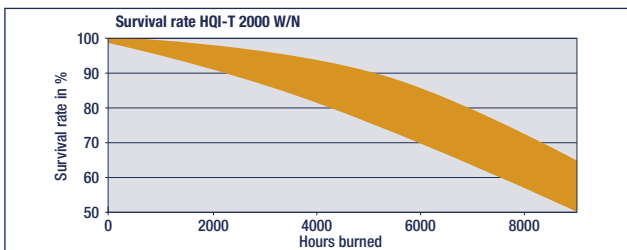
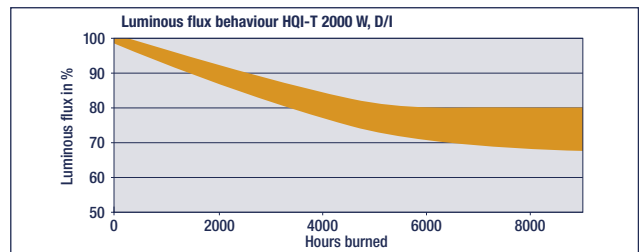
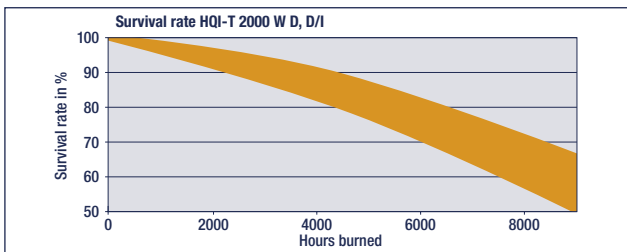
		HQI-T 1000 W D	HQI-T 1000 W N	HQI-T 2000 W D	HQI-T 2000 W N /E SUPER	HQI-T 2000 W N /SN SUPER
Type						
ILCOS		MT-1000/72/1A-H- E40-76/345/P30	MT-1000/35/2B-H- E40-76/345/P30	MT-2000/72/1A-E- E40-100/430/P30	MT-2000/44/2B-E- E40-100/430/P60	MT-2000/44/2B-E- E40-100/430/P60
Lamp wattage	W	1050	1000	2050	2000	2000
Mains voltage	V	230	230	400	400	400
Lamp voltage	V	130	125	230	220	220
Ignition voltage min./max.	kVs	4/5	4/5	4/5	4/5	0.9/1.3
Lamp current	A	8.9	9.1	10.2	9.4	9.4
Nominal gear current	A	9.5	9.5	10.3	8.8	8.8
Nominal luminous flux	lm	85000	110000	180000	220000	220000
Luminous efficacy	lm/W	81	110	88	110	110
Light colour/Colour appearance		D	N	D	N	N
Colour temperature	K	7250	3500	7250	4400	4400
Colour rendering index	R _a	90	65	90	65	65
NIOSH Skin	h	> 25		> 50	> 23	> 24
ACGIH UV output	mW/m ² · 1000 lx	< 0.33		< 0.15	< 0.36	< 0.35
Base		E40	E40	E40	E40	E40
Diameter d	mm	76	76	100	100	100
Length max. l	mm	345	345	430	430	430
LCL a	mm	220	220	265	265	265
Burning position		p 30	p 30	p 30	p 60	p 60
Average lamp life	h	9000	9000	9000	9000	9000
Max. perm. outer bulb temp.	°C	500	500	500	500	500
Max. perm. base edge temp.	°C	250	250	250	250	250
PF corr. cap. at 50 Hz	µF	85	85	60	37	37
Lamp reference		HQI-T 1000W/D	HQI-T 1000W/N	HQI-T 2000W/D	HQI-T 2000W/N/E SUPER	HQI-T 2000W/N/SN SUPER
EAN		4050300015323	4008321116604	4050300015330	4050300301860	4050300348629
Standard pack	Qty	6	6	4	4	4
Figure	No.	1	1	2	2	2
Circuit (see page 22)	Fig. no.	2	2	2	2	2

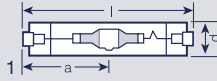


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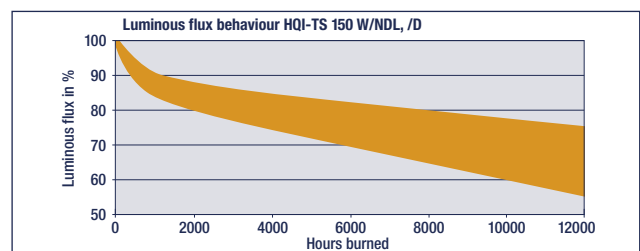
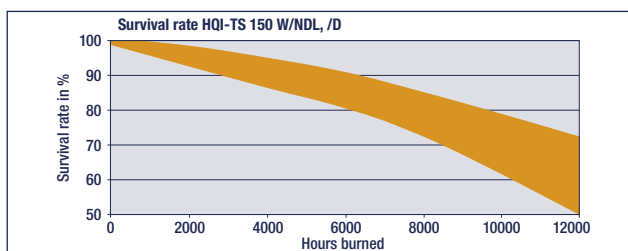
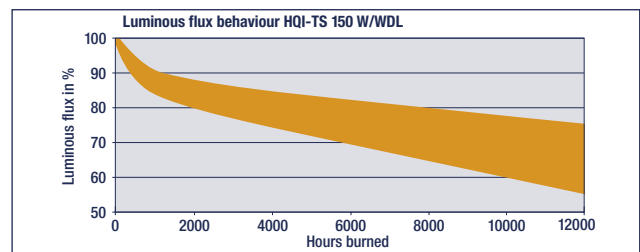
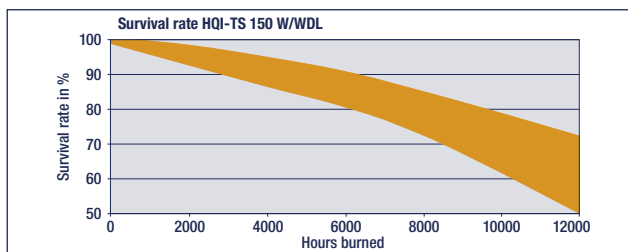
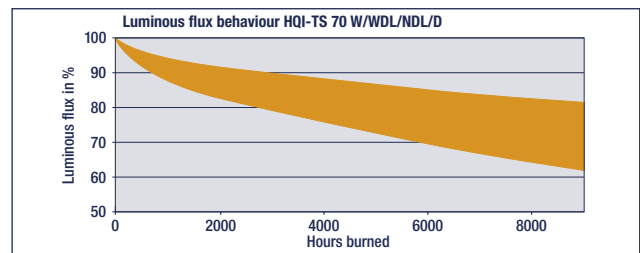
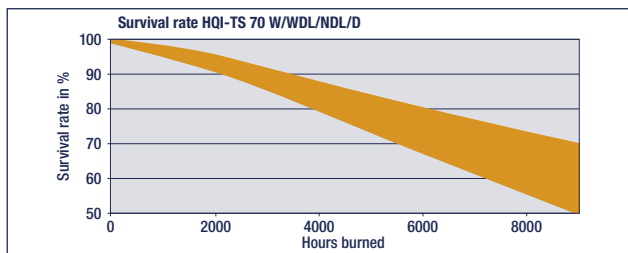


		HQI-T 2000 W N 230 V	HQI-T 2000 W D /I	HQI-T 2000 W N without igniter
Type				
ILCOS		MT-2000/44/2B-E-E40-100/430/P30	MT-2000/72/1A-E/I-E40-100/430/P30	MT-2000/40/2B-E/I-E40-100/430/P60
Lamp wattage	W	1900	2050	2000
Mains voltage	V	230	400	400
Lamp voltage	V	120	230	230
Ignition voltage min./max.	kVs	0.7	not reqd.	not reqd.
Lamp current	A	16.5	10.3	9.0
Nominal gear current	A	16.5	10.3	8.8
Nominal luminous flux	lm	190000	180000	200000
Luminous efficacy	lm/W	100	88	100
Light colour/Colour appearance		N	D	D
Colour temperature	K	4400	7250	4000
Colour rendering index	R _a	65	90	65
NIOSH Skin	h	> 19	> 42	> 10
ACGIH UV output	mW/m ² · 1000 lx	< 0.43	< 0.2	< 0.81
Base		E40	E40	E40
Diameter d	mm	100	100	100
Length max. l	mm	430	430	430
LCL a	mm	265	265	265
Burning position		p 30	p 30	p 60
Average lamp life	h	9000	9000	9000
Max. perm. outer bulb temp.	°C	500	500	500
Max. perm. base edge temp.	°C	250	250	250
PF corr. cap. at 50 Hz	µF	125	60	37
Lamp reference		HQI-T 2000W/N/230 V	HQI-T 2000W/D/I	HQI-T 2000W/N
EAN		4050300421582	4050300015446	4050300015347
Standard pack	Qty	4	4	4
Figure	No.	1	1	1
Circuit (see page 22)	Fig. no.	2	1	1

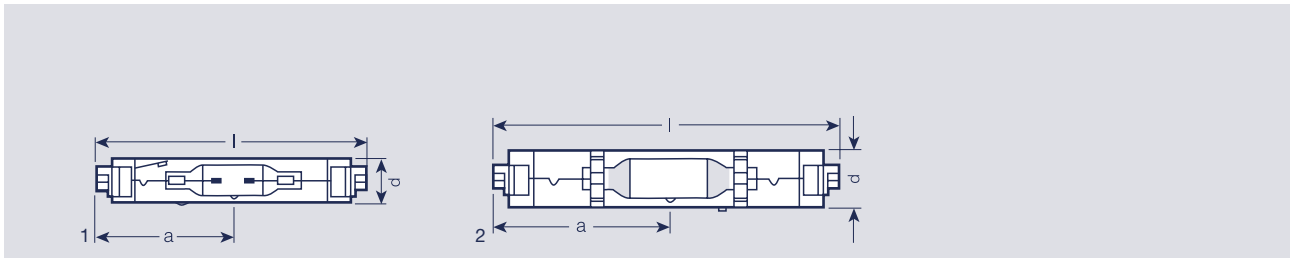




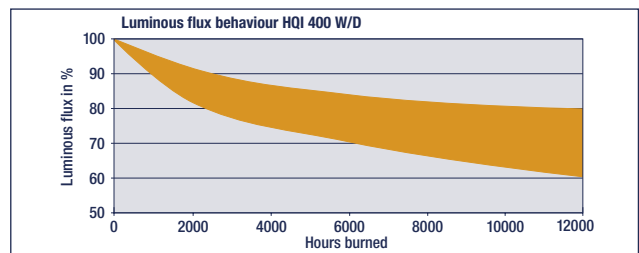
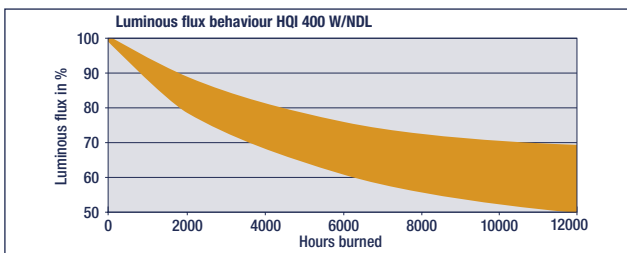
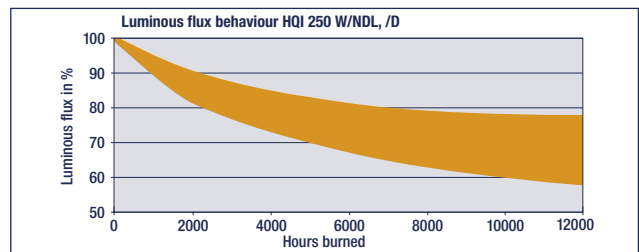
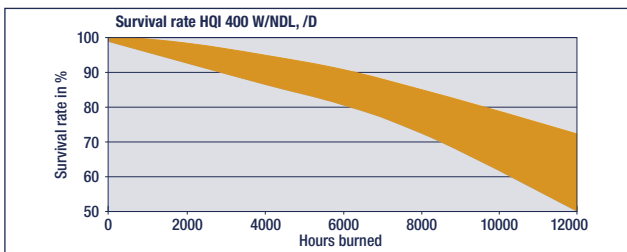
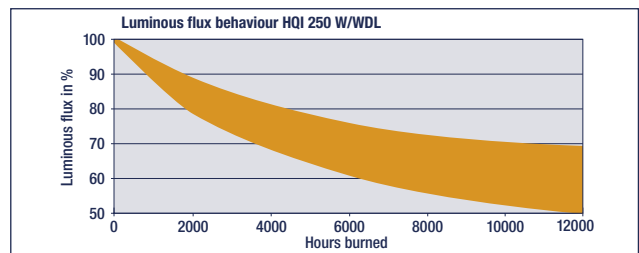
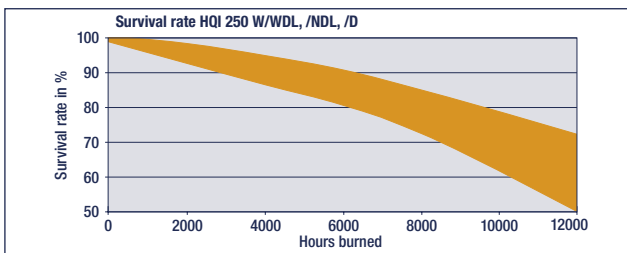
		HQI-TS 70 W	HQI-TS 70 W	HQI-TS 70 W	HQI-TS 150 W	HQI-TS 150 W	HQI-TS 150 W
		WDL	NDL	D	WDL	NDL	D
Type		UVS	UVS	UVS	UVS	UVS	UVS
ILCOS		MD/UB-70/30/2B-H- RX7s-20/114.2/P45	MD/UB-70/40/1B-H- RX7s-20/114.2/P45	MD/UB-70/52/1B-H- RX7s-20/114.2/P45	MD/UB-150/30/1B-H- RX7s24-23/132/P45	MD/UB-150/42/1B-H- RX7s24-23/132/P45	MD/UB-150/52/1B-H- RX7s24-23/132/P45
Lamp wattage	W	75	73	75	150	150	150
Lamp voltage	V	95	85	110	95	90	100
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5	3.6/5	3.6/5
Lamp current	A	1	1	1	1.8	1.8	1.8
Nominal luminous flux	lm	5100	5700	5500	11700	12000	12000
Luminous efficacy	lm/W	71	76	73	78	80	80
Light colour/Colour appearance		WDL	NDL	D	WDL	NDL	D
Colour temperature	K	3000	4000	5200	3000	4200	5200
Colour rendering index	Ra	76	83	85	76	87	91
NIOSH Skin	h	> 23	> 7	> 16	> 41	> 10.2	> 11.7
ACGIH UV output	mW/lm ² · 1000 lx	< 0.36	< 1.26	< 0.52	< 0.2	< 0.8	< 0.7
Base		RX7s	RX7s	RX7s	RX7s-24	RX7s-24	RX7s-24
Diameter d	mm	20	20	20	23	23	23
Length max. l	mm	114.2	114.2	114.2	132	132	132
LCL a	mm	57	57	57	66	66	66
Burning position		p 45	p 45	p 45	p 45	p 45	p 45
Average lamp life	h	12000	12000	12000	12000	12000	12000
Max. perm. outer bulb temp.	°C	500	500	500	650	650	650
Max. perm. pinch temp.	°C	280	280	280	280	280	280
PF corr. cap. at 50 Hz	µF	12	12	12	20	20	20
Lamp reference		HQI-TS 70W/WDL	HQI-TS 70W/NDL	HQI-TS 70W/D	HQI-TS 150W/WDL	HQI-TS 150W/NDL	HQI-TS 150W/D
EAN		4050300412955	4050300412931	4050300437521	4050300412979	4050300362380	4050300437545
Standard pack	Qty	12	12	12	12	12	12
Figure	No.	1	1	1	1	1	1
Circuit (see page 22)	Fig. no.	2/3/5	2/3/5	2/5	2/3/5	2/3/5	2/5



POWERSTAR® HQI®-TS

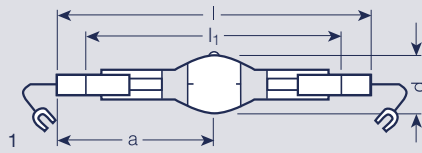


		HQI-TS 250 W	HQI-TS 250 W	HQI-TS 250 W	HQI-TS 400 W	HQI-TS 400 W	HQI-TS 400 W
		WDL	NDL	D	NDL	D	D
Type		UVS	UVS	UVS	UVS	UVS, NAV-VG	UVS, HQI-VG
ILCOS		MD/UB-250/32/1B-H-Fc2-25/163/P45	MD/UB-250/42/1B-H-Fc2-25/163/P45	MD/UB-250/51/1A-H-Fc2-25/163/P45	MD/UB-400/42/1B-H-Fc2-31/206/P45	MD/UB-400/52=56/1A-H-Fc2-31/206/P45	MD/UB-400/52=56/1A-H-Fc2-31/206/P45
Lamp wattage	W	250	250	250	400	400	350
Lamp voltage	V	110	100	100	120	125	120
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3/5	3/5	3/5	3/5
Lamp current	A	2.8	3	3	4.1 ¹⁾	4.1	3.6
Nominal luminous flux	lm	22000	20000	20000	36000	37000	31000
Luminous efficacy	lm/W	88	82	82	90	90	89
Light colour/Colour appearance		WDL	NDL	D	NDL	D	D
Colour temperature	K	3200	4200	5100	4200	5200	5600
Colour rendering index	R _a	80	88	93	88	93	90
NIOSH Skin	h	> 12	> 12	> 18	> 11 min	> 11 min	> 11 min
ACGIH UV output	mW/lm ² · 1000 lx	< 0.68	< 0.71	< 0.46	< 47	< 46	< 46
Base		Fc2	Fc2	Fc2	Fc2	Fc2	Fc2
Diameter d	mm	25	25	25	31	31	31
Length max. l	mm	163	163	163	206	206	206
LCL a	mm	81.5	81.5	81.5	103	103	103
Burning position		p 45	p 45	p 45	p 45	p 45	p 45
Average lamp life	h	12000	12000	12000	12000	12000	12000
Max. perm. outer bulb temp.	°C	650	650	650	650	650	650
Max. perm. pinch temp.	°C	300	300	300	300	300	300
PF corr. cap. at 50 Hz	µF	32	32	32	45	45	35
Lamp reference		HQI-TS 250W/WDL	HQI-TS 250W/NDL	HQI-TS 250W/D	HQI-TS 400W/NDL	HQI-TS 400W/D	HQI-TS 400W/D
EAN		4050300436012	4050300436036	4050300436050	4050300304090	4050300015385	4050300015385
Standard pack	Qty	12	12	12	12	12	12
Figure	No.	1	1	1	2	2	2
Circuit (see page 22)	Fig. no.	2/3	2/3	2	2/3	2	2

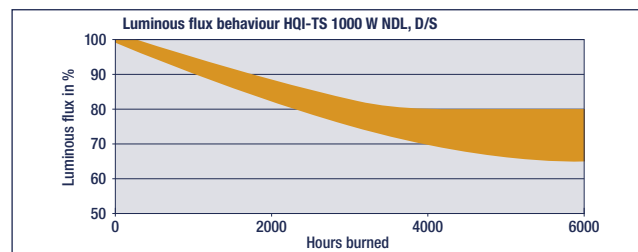
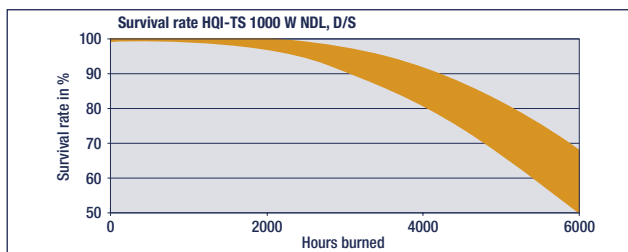


1) Operate only with NAV control gear.

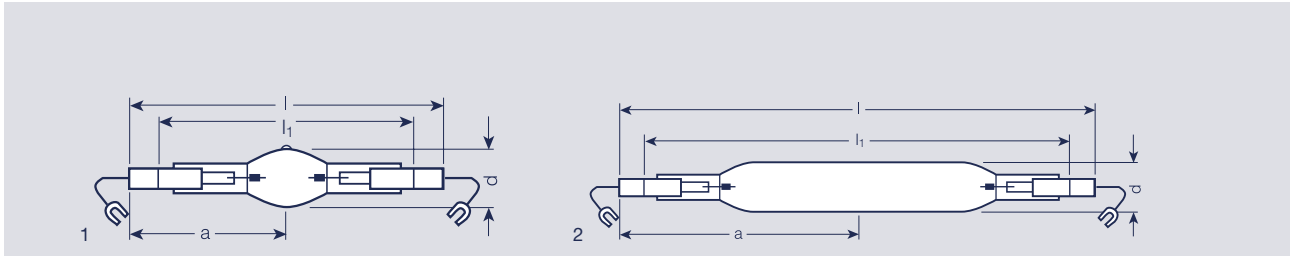
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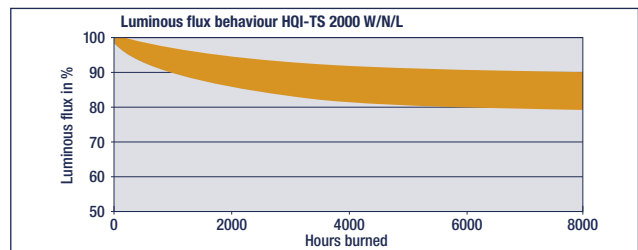
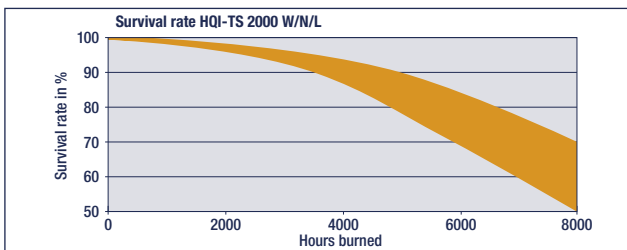
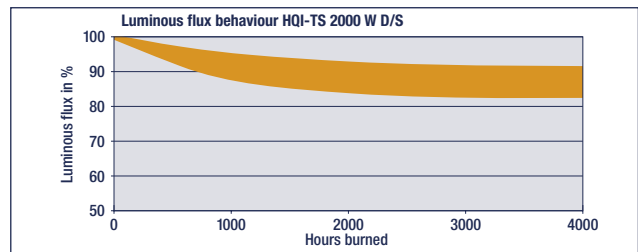
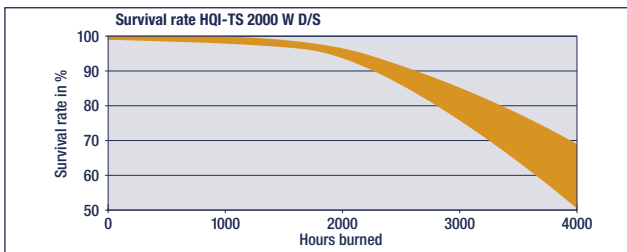
		HQI-TS 1000 W NDL /S	HQI-TS 1000 W D /S
Type			
ILCOS		MN-1000/44/1B-H-cable lug-36/187/P15	MN-1000/59/1A-H-cable lug-36/187/P15/S15
Lamp wattage	W	1000	1000
Lamp voltage	V	120	120
Ignition voltage min./max.	kVs	4/5	4/5
Hot restrike	kVs	36	36
Lamp current	A	9.2	9.4
Nominal gear current	A	9.5	9.5
Nominal luminous flux	lm	90000	90000
Luminous efficacy	lm/W	90	90
Light colour/Colour appearance		NDL	D
Colour temperature	K	4400	5900
Colour rendering index	R _a	> 85	≥ 90
NIOSH Skin	h	> 15 min	> 5.5 min
ACGIH UV output	mW/m ² · 1000 lx	< 34	< 92
Base		cable	cable
Diameter d	mm	36	36
Insertion length l ₁	mm	157	157
Length max. l	mm	187	187
LCL a	mm	93	93
Burning position		p 15	p 15/s 15
Average lamp life	h	6000	6000
Max. perm. outer bulb temp.	°C	950	950
Max. perm. pinch temp.	°C	390	390
PF corr. cap. at 50 Hz	µF	85	85
Lamp reference		HQI-TS 1000W/NDL/S	HQI-TS 1000W/D/S
EAN		4050300349916	4050300300092
Standard pack	Qty	10	10
Figure	No.	1	1
Circuit (see page 22)	Fig. no.	2/3	2/3



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	HQI-TS 2000 W D /S	HQI-TS 2000 W D /S/V	HQI-TS 2000 W NDL /S	HQI-TS 2000 W NDL /S/V	HQI-TS 2000 W N /L
Type					
ILCOS	MN-2000/59/1A-E-cable lug-36/187/P15	MN-2000/59/1A-H-cable lug-36/187/S15	MN-2000/44/1B-E-cable lug-36/187/P15	MN-2000/44/1B-H-cable lug-36/187/S15	MN-2000/44/1B-E-cable lug-36/187/P15
Lamp wattage	W 1950	1950	1950	1950	2150
Lamp voltage	V 205	205	205	205	220
Ignition voltage min./max.	kVs 4/5	4/5	4/5	4/5	4/5
Hot restrike	kVs 36	36	36	36	-
Lamp current	A 11.5 ¹⁾	11.3 ¹⁾	11.3 ¹⁾	11.3 ¹⁾	10.7
Nominal gear current	A 10.3	10.3	10.3	10.3	10.3
Nominal luminous flux	lm 200000	200000	200000	200000	230000
Luminous efficacy	lm/W 103	103	103	103	107
Light colour/Colour appearance	D	D	NDL	NDL	N
Colour temperature	K 5900	5900	4400	4400	4400
Colour rendering index	Ra ≥ 90	≥ 90	> 85	> 85	≥ 65
NIOSH Skin	h > 15 min	> 15 min			> 3.4 min
ACGIH UV output	mW/m ² · 1000 lx < 33	< 33			< 148
Base	cable	cable	cable	cable	cable
Diameter d	mm 36	36	36	36	32
Insertion length l ₁	mm 157	157	157	157	242
Length max. l	mm 187	187	187	187	275
LCL a	mm 93	93	93	93	137
Burning position	p 15	s 15 ²⁾	p 15	s 15 ²⁾	p 15
Average lamp life	h 4000	-	4000	-	8000
Max. perm. outer bulb temp.	°C 950	950	950	950	950
Max. perm. pinch temp.	°C 390	390	390	390	390
PF corr. cap. at 50 Hz	µF 60	60	60	60	60
Lamp reference	HQI-TS 2000W/D/S	HQI-TS 2000W/D/S/V	HQI-TS 2000W/NDL/S	HQI-TS 2000W/NDL/S/V	HQI-TS 2000W/N/L
EAN	4050300271682	4050300977232	4008321910196	4008321910202	4050300607344
Standard pack	Qty 10	10	10	10	10
Figure	No. 1	1	1	1	2
Circuit (see page 22)	Fig. no. 2/4	2/4	2/4	2/4	2/4

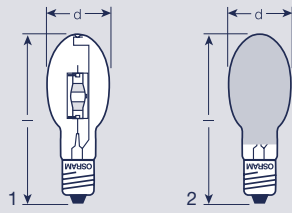


1) Lamps may only be operated on 10.3 A chokes!

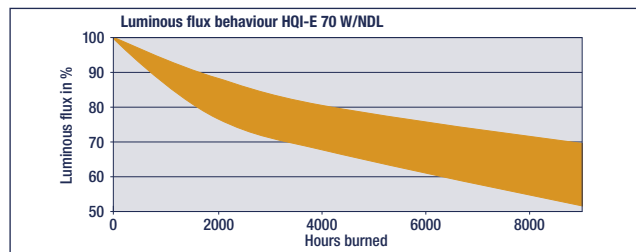
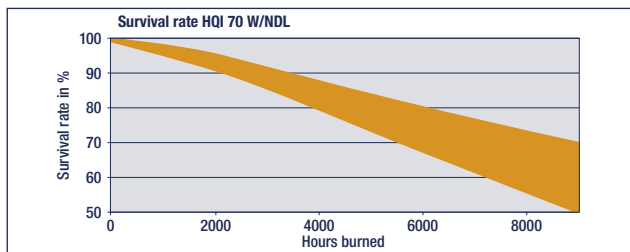
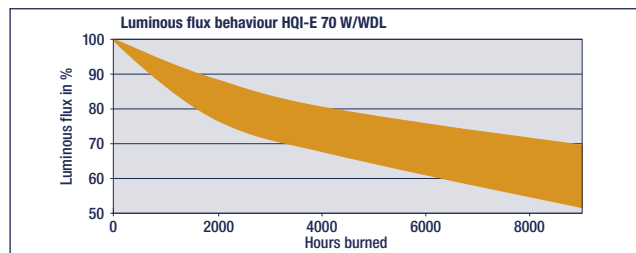
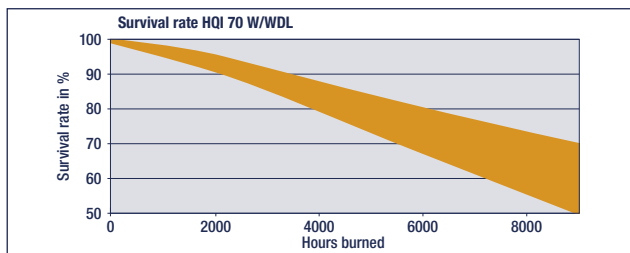
2) Lamps to be operated in axially symmetrical luminaires only where the lamp is situated along the axis.

For all 2000 W lamps:
Operation on 400 V supply voltage.

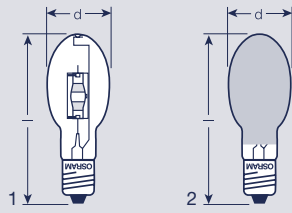
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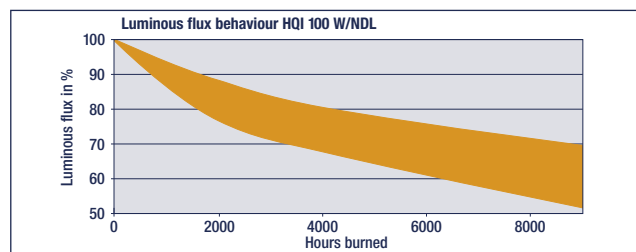
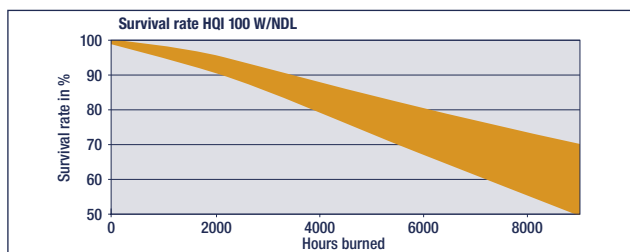
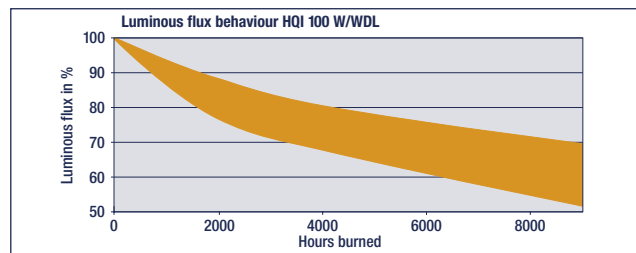
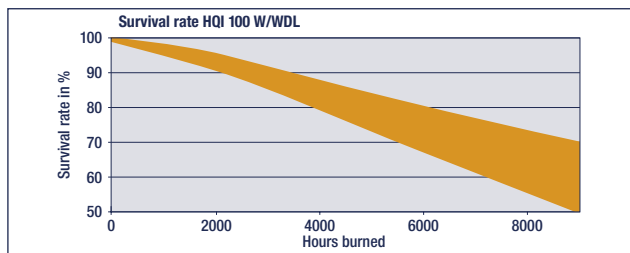
		HQI-E 70 W WDL clear for open luminaires	HQI-E 70 W WDL coated for open luminaires	HQI-E 70 W NDL clear for open luminaires	HQI-E 70 W NDL coated for open luminaires
Type		UVS	UVS	UVS	UVS
ILCOS		MCS/UB-70/32/ 1B-H-E27-55/144	MES/UB-70/30/ 1B-H-E27-55/144	MCS/UB-70/40/ 1B-H-E27-55/144	MES/UB-70/38/ 1B-H-E27-55/144
Lamp wattage	W	73	73	73	73
Lamp voltage	V	95	95	95	95
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5
Lamp current	A	0.95	0.95	1	1
Nominal luminous flux	lm	5200	4700	5500	5100
Luminous efficacy	lm/W	71	64	75	70
Light colour/Colour appearance		WDL	WDL	NDL	NDL
Colour temperature	K	3000	2900	4200	4000
Colour rendering index	R _a	70	70	70	70
NIOSH Skin	h	> 50	> 50	> 50	> 50
ACGIH UV output	mW/m ² · 1000 lx	< 0.06	< 0.06	< 0.05	< 0.05
Base		E27	E27	E27	E27
Diameter d	mm	55	55	55	55
Length max. l	mm	144	144	144	144
LCL a	mm	92	-	92	-
Burning position		universal	universal	universal	universal
Average lamp life	h	9000	9000	6000	6000
Max. perm. outer bulb temp.	°C	330	330	330	330
Max. perm. base edge temp.	°C	190	190	190	190
PF corr. cap. at 50 Hz	µF	12	12	12	12
Lamp reference		HQI-E 70W/WDL clear	HQI-E 70W/WDL coated	HQI-E 70W/NDL clear	HQI-E 70W/NDL coated
EAN		4050300397788	4050300397801	4050300397825	4050300397849
Standard pack	Qty	20	20	20	20
Figure	No.	1	2	1	2
Circuit (see page 22)	Fig. no.	2/5	2/5	2/5	2/5



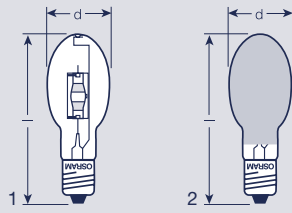
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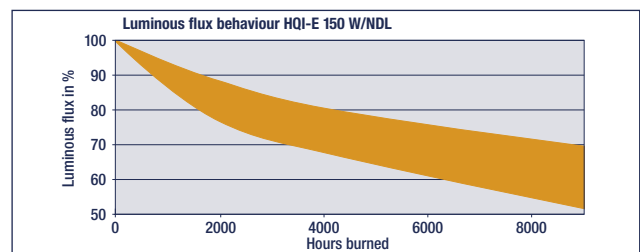
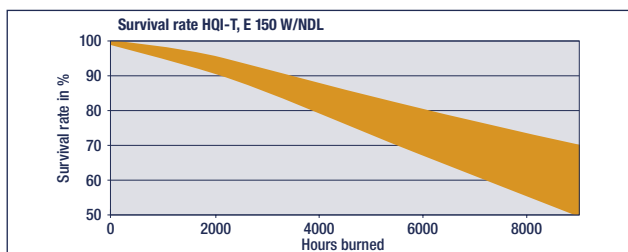
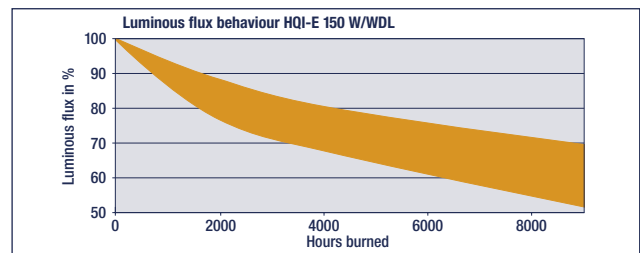
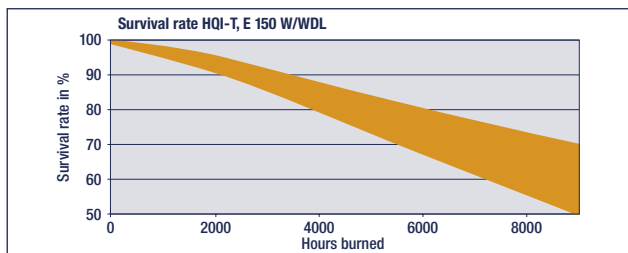
		HQI-E 100 W WDL clear for open luminaires	HQI-E 100 W WDL coated for open luminaires	HQI-E 100 W NDL clear for open luminaires	HQI-E 100 W NDL coated for open luminaires
Type		UVS	UVS	UVS	UVS
ILCOS		MCS/UB-100/30/ 1B-H-E27-55/144	MES/UB-100/29/ 1B-H-E27-55/144	MCS/UB-100/40/ 1B-H-E27-55/144	MES/UB-100/38/ 1B-H-E27-55/144
Lamp wattage	W	100	100	100	100
Lamp voltage	V	95	95	95	95
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5
Lamp current	A	1.1	1.1	1.1	1.1
Nominal luminous flux	lm	8500	7900	8400	7700
Luminous efficacy	lm/W	85	79	84	77
Light colour/Colour appearance		WDL	WDL	NDL	NDL
Colour temperature	K	3000	2900	4200	4000
Colour rendering index	R _a	85	80	70	70
NIOSH Skin	h	> 50	> 50	> 50	> 50
ACGIH UV output	mW/m ² · 1000 lx	< 0.04	< 0.04	< 0.03	< 0.04
Base		E27	E27	E27	E27
Diameter d	mm	55	55	55	55
Length max. l	mm	144	144	144	144
LCL a	mm	92	–	92	–
Burning position		universal	universal	universal	universal
Average lamp life	h	9000	9000	6000	6000
Max. perm. outer bulb temp.	°C	330	330	330	330
Max. perm. base edge temp.	°C	190	190	190	190
PF corr. cap. at 50 Hz	µF	16	16	16	16
Lamp reference		HQI-E 100W/WDL clear	HQI-E 100W/WDL coated	HQI-E 100W/NDL clear	HQI-E 100W/NDL coated
EAN		4050300351537	4050300351551	4050300345871	4050300345833
Standard pack	Qty	20	20	20	20
Figure	No.	1	2	1	2
Circuit (see page 22)	Fig. no.	2	2	2	2



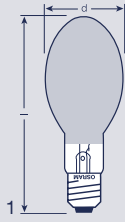
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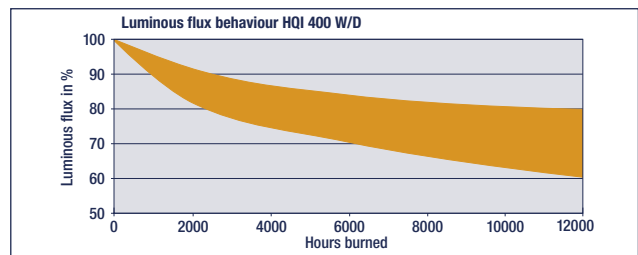
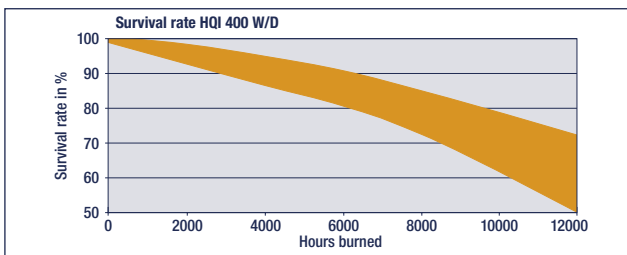
		HQI-E 150 W WDL clear for open luminaires	HQI-E 150 W WDL coated for open luminaires	HQI-E 150 W NDL clear for open luminaires	HQI-E 150 W NDL coated for open luminaires
Type		UVS	UVS	UVS	UVS
ILCOS		MCS/UB-150/29/ 1B-H-E27-55/144	MES/UB-150/29/ 1B-H-E27-55/144	MCS/UB-150/40/ 1B-H-E27-55/144	MES/UB-150/38/ 1B-H-E27-55/144
Lamp wattage	W	150	150	150	150
Lamp voltage	V	95	95	85	85
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5
Lamp current	A	1.8	1.8	1.8	1.8
Nominal luminous flux	lm	12900	11600	12500	11500
Luminous efficacy	lm/W	86	77	83	77
Light colour/Colour appearance		WDL	WDL	NDL	NDL
Colour temperature	K	3000	2900	4200	4000
Colour rendering index	R _a	70	70	80	86
NIOSH Skin	h	> 50	> 50	> 50	> 50
ACGIH UV output	mW/m ² · 1000 lx	< 0.17	< 0.17	< 0.17	< 0.03
Base		E27	E27	E27	E27
Diameter d	mm	55	55	55	55
Length max. l	mm	144	144	144	144
LCL a	mm	92	–	92	–
Burning position		universal	universal	universal	universal
Average lamp life	h	9000	9000	6000	6000
Max. perm. outer bulb temp.	°C	330	330	330	330
Max. perm. base edge temp.	°C	190	190	190	190
PF corr. cap. at 50 Hz	µF	20	20	20	20
Lamp reference		HQI-E 150W/WDL clear	HQI-E 150W/WDL coated	HQI-E 150W/NDL clear	HQI-E 150W/NDL coated
EAN		4050300433974	4050300433998	4050300434018	4050300434032
Standard pack	Qty	20	20	20	20
Figure	No.	1	2	1	2
Circuit (see page 22)	Fig. no.	2/5	2/5	2/5	2/5



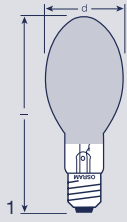
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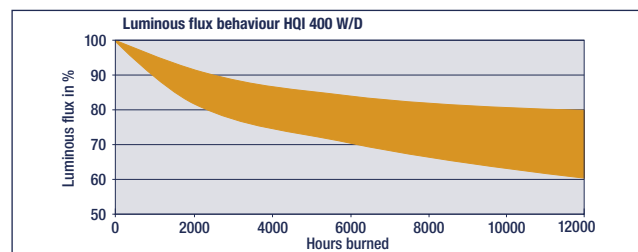
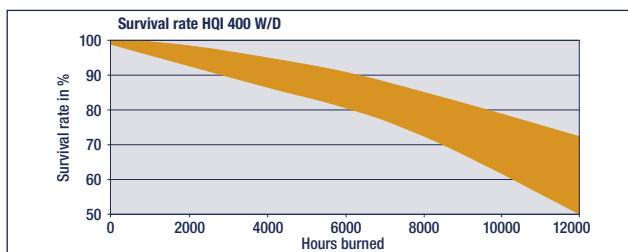
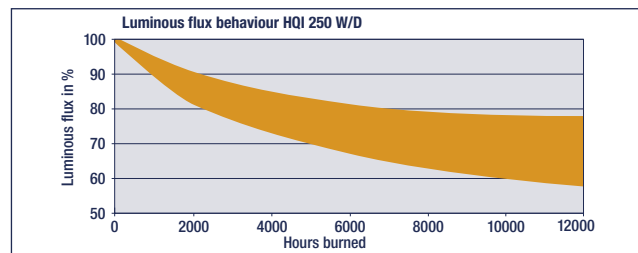
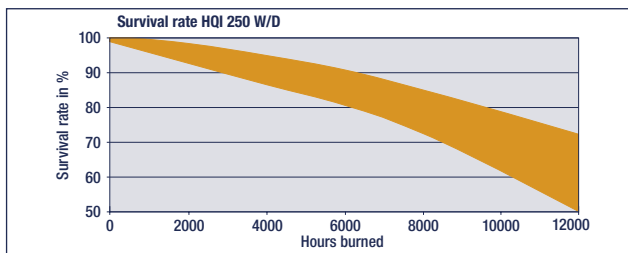
		HQI-E/P 250 W	HQI-E/P 400 W	HQI-E/P 400 W
		D	D	D
		coated	coated	coated
		for open luminaires	for open luminaires	for open luminaires
Type		UVS	UVS, NAV-VG	UVS, HQI-VG
ILCOS		MES/UB-250/52/1A-H-E40-90/226	MES/UB-400/45=50/1A-H-E40-120/290	MES/UB-400/45=50/1A-H-E40-120/290
Lamp wattage	W	250	400	400
Lamp voltage	V	100	110	115
Ignition voltage min./max.	kVs	3/5	3/5	3/5
Lamp current	A	3	3.8	3.5
Nominal luminous flux	lm	17000	31000	25000
Luminous efficacy	lm/W	71	76	71
Light colour/Colour appearance		D	D	D
Colour temperature	K	5200	4700	5200
Colour rendering index	R _a	90	90	90
NIOSH Skin	h	> 50	> 50	> 50
ACGIH UV output	mW/m ² · 1000 lx	< 0.12	< 0.11	< 0.11
Base		E40	E40	E40
Diameter d	mm	90	120	120
Length max. l	mm	226	290	290
LCL a	mm	-	-	-
Burning position		universal	universal	universal
Average lamp life	h	6000	12000	12000
Max. perm. outer bulb temp.	°C	400	400	400
Max. perm. base edge temp.	°C	250	250	250
PF corr. cap. at 50 Hz	µF	32	45	35
Lamp reference		HQI-E/P 250W/D	HQI-E/P 400W/D	HQI-E/P 400W/D
EAN		4050300637457	4050300637433	4050300637433
Standard pack	Qty	12	12	12
Figure	No.	1	1	1
Circuit (see page 22)	Fig. no.	2	2	2



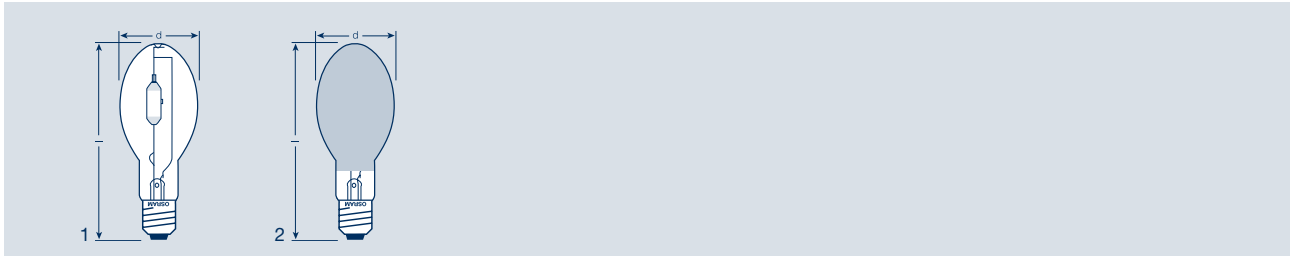
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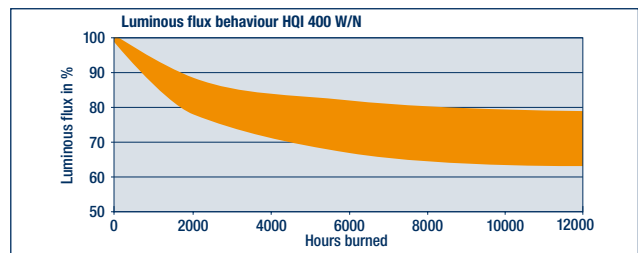
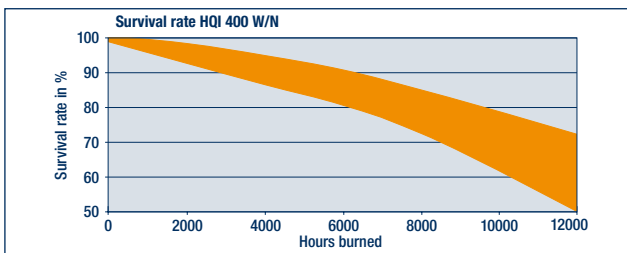
		HQI-E 250 W D coated	HQI-E 400 W D coated	HQI-E 400 W D coated
Type			NAV-VG	HQI-VG
ILCOS		ME/UB-250/52/ 1A-H-E40-90/226	ME/UB-400/53=55/ 1A-H-E40-120/290	ME/UB-400/53=55/ 1A-H-E40-120/290
Lamp wattage	W	250	460	400
Lamp voltage	V	100	130	110
Ignition voltage min./max.	kVs	3/5	3/5	3/5
Lamp current	A	3	3.8	3.6
Nominal gear current	A		4.6	3.5
Nominal luminous flux	lm	19000	34000	26000
Luminous efficacy	lm/W	78	81	72
Light colour/Colour appearance		D	D	D
Colour temperature	K	5200	5300	5500
Colour rendering index	R _a	90	90	90
NIOSH Skin	h	> 27	> 18	> 18
ACGIH UV output	mW/m ² · 1000 lx	< 0.31	< 0.46	< 0.46
Base		E40	E40	E40
Diameter d	mm	90	120	120
Length max. l	mm	226	290	290
LCL a	mm	-	-	-
Burning position		universal	universal	universal
Average lamp life	h	12000	12000	12000
Max. perm. outer bulb temp.	°C	400	400	400
Max. perm. base edge temp.	°C	250	250	250
PF corr. cap. at 50 Hz	µF	32	45	35
Lamp reference		HQI-E 250W/D	HQI-E 400W/D	HQI-E 400W/D
EAN		4050300015248	4050300019727	4050300019727
Standard pack	Qty	12	12	12
Figure	No.	1	1	1
Circuit (see page 22)	Fig. no.	2	2	2



POWERSTAR® HQI®-E



		HQI-E 400 W	HQI-E 400 W	HQI-E 400 W	HQI-E 400 W	HQI-E 1000 W
		N	N	N	N	N
		clear	clear	coated	coated	coated
Type		NAV-VG	HQI-VG	NAV-VG	HQI-VG	
ILCOS		MC/UB-400/40=46/ 2B-H-E40-120/285/H45	MC/UB-400/40=46/ 2B-H-E40-120/285/H45	ME/UB-400/38=44/ 2B-H-E40-120/285/H45	ME/UB-400/38=44/ 2B-H-E40-120/285/H45	ME-1000/37/ 2B-H-E40-165/380/H45
Lamp wattage	W	440	380	440	380	1050
Lamp voltage	V	120	120	120	120	130
Ignition voltage min./max.	kVs	3.6/5	3.6/5	3.6/5	3.6/5	4/5
Lamp current	A	4	3.4	4	3.4	9.0
Nominal gear current	A	4.6	3.5	4.6	3.5	9.5
Nominal luminous flux	lm	42000	34000	40000	34000	100000
Luminous efficacy	lm/W	94	90	94	90	91
Light colour/Colour appearance		N	N	N	N	N
Colour temperature	K	4000	4600	3800	4400	3800
Colour rendering index	R _a	65	60	65	60	65
NIOSH Skin	h	> 5.7	> 5.7	> 5.7	> 5.7	> 15
ACGIH UV output	mW/m ² · 1000 lx	< 1.5	< 1.5	< 1.5	< 1.5	< 0.56
Base		E40	E40	E40	E40	E40
Diameter d	mm	120	120	120	120	165
Length max. l	mm	285	285	285	285	380
LCL a	mm	198	198	-	-	-
Burning position		h45	h45	h45	h45	h 45
Average lamp life	h	12000	12000	12000	12000	9000
Max. perm. outer bulb temp.	°C	500	500	500	500	400
Max. perm. base edge temp.	°C	250	250	250	250	250
PF corr. cap. at 50 Hz	µF	45	35	45	35	85
Lamp reference		HQI-E 400W/N clear	HQI-E 400W/N clear	HQI-E 400W/N	HQI-E 400W/N	HQI-E 1000W/N
EAN		4050300292632	4050300292632	4050300305431	4050300305431	4050300015279
Standard pack	Qty	12	12	12	12	6
Figure	No.	1	1	2	2	2
Circuit (see page 22)	Fig. no.	2	2	2	2	2



Please note:

The values and curves published in this document are for guidance only. The basic data was determined under controlled laboratory conditions for a switching cycle of 11 h on/1 h off.

There may be considerable differences in actual practice. The highlighted areas around the curves represent a 90% confidence range based on our test conditions.

NIOSH threshold and ACGIH UV output:

The radiated energy of a lamp is indicated by the defined NIOSH curve.

The NIOSH effective radiated output calculated from this is converted into permitted exposure times with defined limit values.

The ACGIH UV output value correlates directly with the NIOSH value and represents the current required value for UV exposure.

PF correction capacitor:

The pf correction capacitors are designed so that $\cos \varphi \geq 0.9$ is achieved at rated voltage.

Operating instructions

Supply voltage:

The lamps must be connected via suitable control gear. A 240 V / 50 Hz ac supply is generally required. If a different supply voltage is used (e.g. 400 V / 50 Hz) control gear with appropriate taps must be used.

Permitted mains voltage deviation: $\pm 3\%$

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 colour or luminous flux. Lamp life may also be reduced.

Control gear:

Conventional control gear: Choke, igniter and pf correction capacitor.

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

Igniters must always be installed close to the lamp.

The choke may be installed any distance from the lamp, provided the permissible voltage drop is not exceeded. For power supplies with a neutral conductor the choke should be connected to the live conductor. In the case of luminaires in which there are no lamps installed, the ignition equipment (igniter, ignition pulser) must be disabled when voltage is applied otherwise the igniters may produce radio interference.

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.

When high-pressure discharge lamps come to the end of their lives a rectifier effect may occur (see IEC 62035). This is not manufacturer-specific. Because of the excessive dc current components the ballasts and igniters may become overheated.

High-pressure discharge lamps should therefore only be operated with control gear with thermal protection. This applies also to control gear with the option of power reduction.

The following lamps with integrated igniters will start on mains voltage:

- HQI®-T 2000 /D/I
- HQI®-T 2000 /N

The lamps must not be operated with integrated igniters in luminaires equipped with igniters.

Suitable igniters and control gear for POWERSTAR® are available from the electrical industry.

In the case of igniters equipped with OSRAM switching element SE 600 (built-in spark gap), SE 600 must be replaced each time the lamp is replaced.

Operating temperatures:

Only high-pressure discharge lamps with external igniters are suitable for low-temperature applications down to $-50\text{ }^{\circ}\text{C}$. Such applications call for special (heatable) igniters such as MZN 400 SU-LT from BAG Turgi (for lamps from 100 to 400 W).

Power factor:

CCG: Because of the series connected choke this is around 0.5 to 0.7 (without compensation)

ECG: If **POWERTRONIC®** is used the power factor is greater than 0.96. Compensation is therefore not needed here.

Switching on:

Full luminous flux is reached only a few minutes after the lamp is switched on. The start-up current may be up to twice the operating current depending on the control gear. (See also the graphs on p. 21)

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.

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

- the light colour of the lamp changes dramatically
- there is a significant loss of brightness
- the lamp no longer ignites
- 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 **20 01 21*** 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 up to 400 W are of UV-reduced design. The lamp packaging will indicate this fact until there is any change. Because of their high operating pressure all HQI-lamps may only be used in fully enclosed luminaires designed to take them:

- All HQI®-TS
- All HQI®-T
- All HQI®-E \geq 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:**

- All HQI®-E 70 W to 150 W
- 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[®]-TS and HCl[®]-TS is given in IEC 61167, clause 1.7.

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).

Survival rate:

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

Minimum life:

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

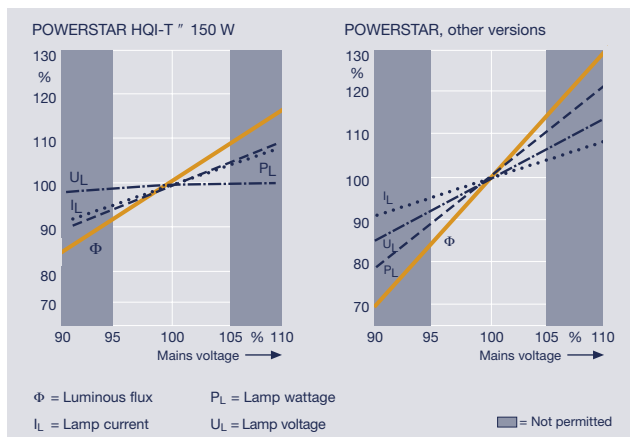
Economical life:

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.

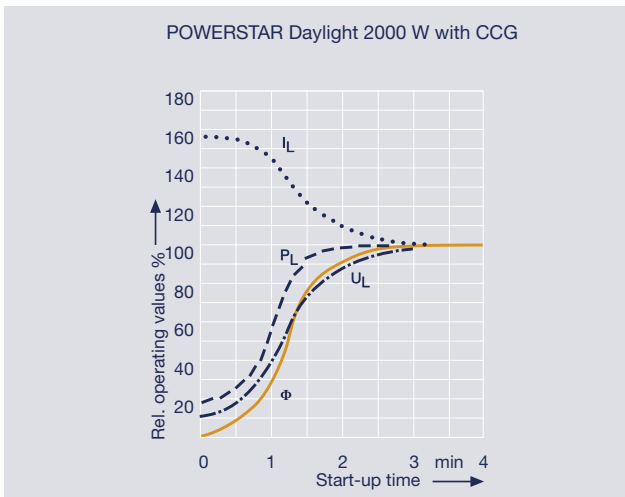
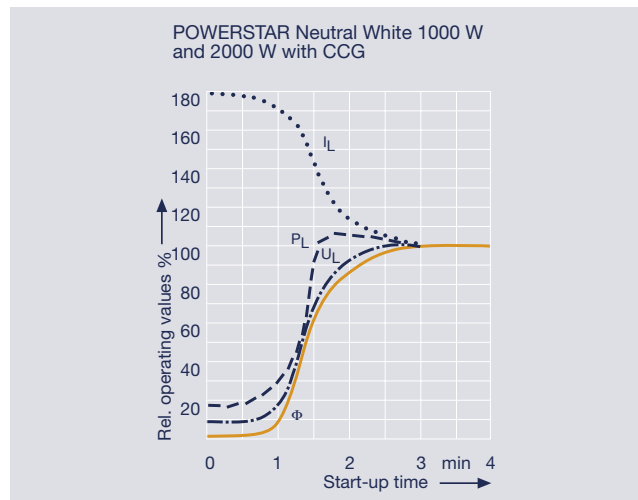
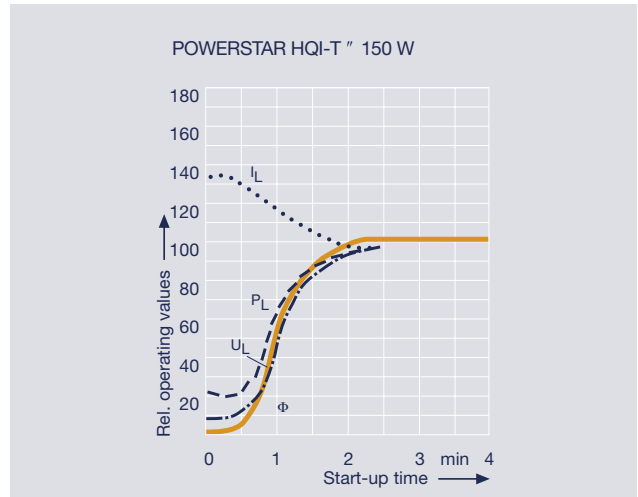
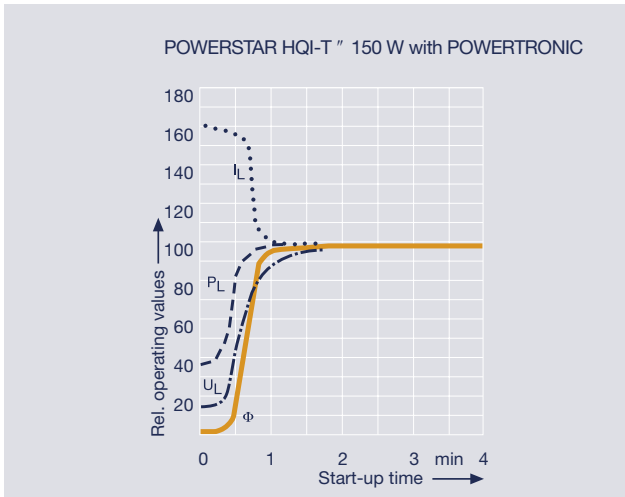
Service life:

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 70% (sometimes 80%).

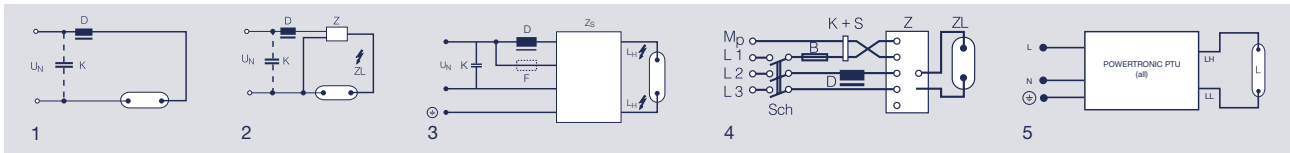
Operating characteristics in relation to the supply voltage



Start-up behaviour (average value)



Circuit diagrams



- B = 6A fuse, slow acting
- D = Choke
- F = Protection on demand
- K = PF correction capacitor
- K+S = Time-limiting switch and contactor
- L = Lamp
- LH = High-voltage terminal
- Mp = Neutral conductor
- Sch = Switch

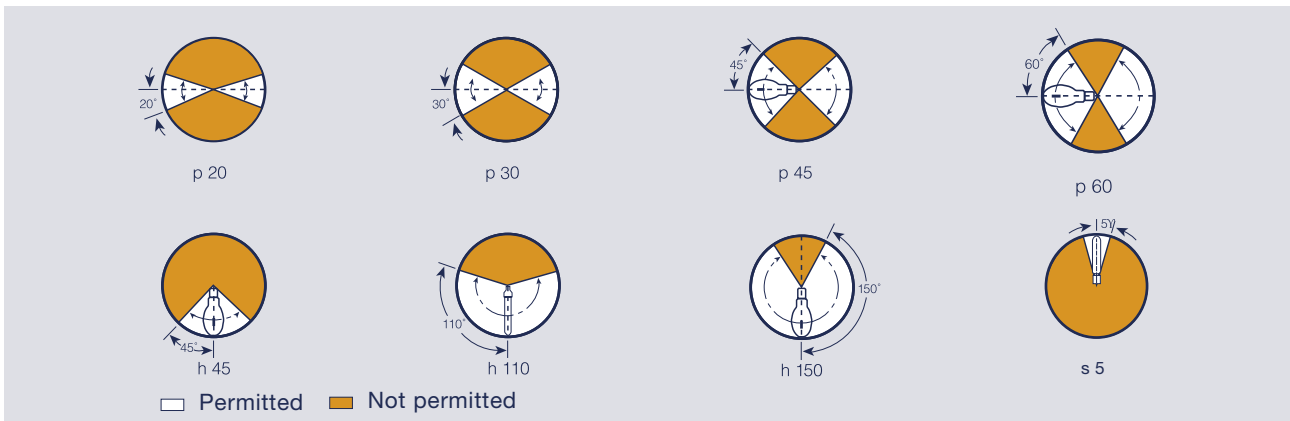
- U_N = 230 V ac mains voltage (for 2000 W = 400 V ac)
- Z = Igniter to be installed near the lamp
- ZL = HF igniter lead to contact plate of lamp
- Zs = Symmetrical hot restrike igniter with automatic ignition

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

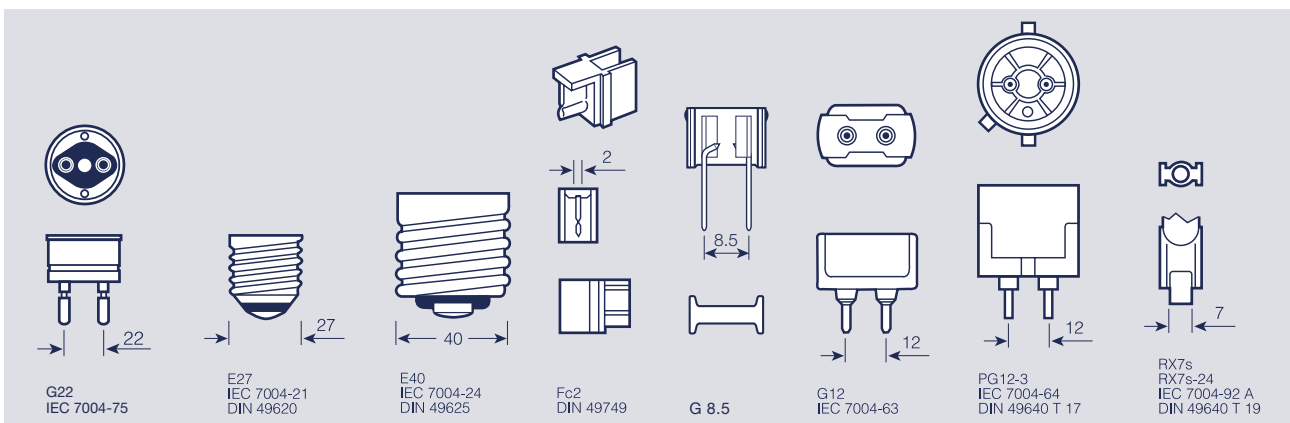
The right igniter for the particular lamp type must be used to ensure reliable and safe ignition.

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

Burning positions

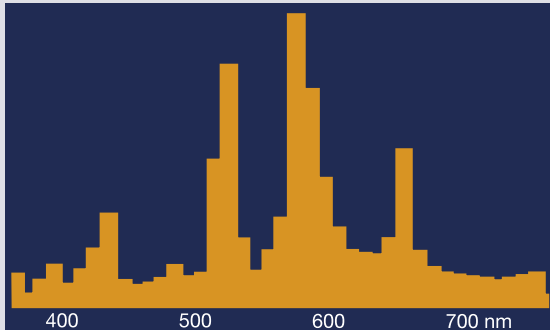


Base

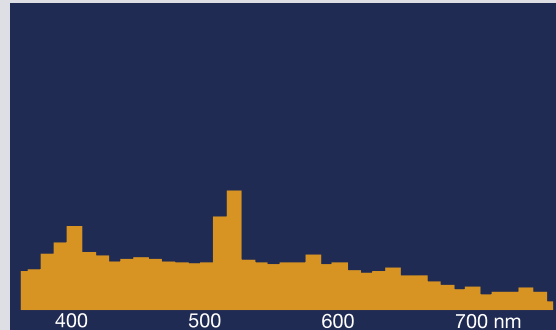


Spectral power distribution of discharge lamps

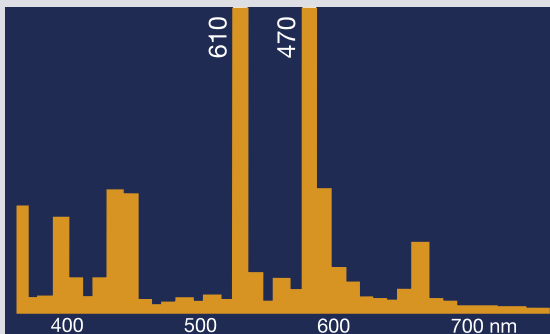
POWERSTAR®



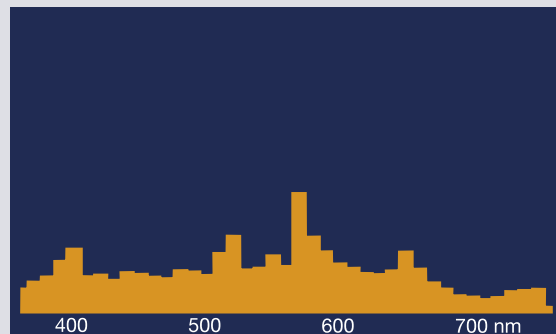
HQI® .../WDL



HQI® .../NDL



HQI® .../N



HQI® .../D

Visible range from 380 to 780 nm

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

Global presence.

OSRAM supplies customers in around 150 countries.

- 65 companies and sales offices for 100 countries
- 48 countries served by local agents or OSRAM GmbH, Munich

OSRAM associated companies and support centres.

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China	Poland
Colombia	Portugal
Croatia	Rumania
Czech Republic	Russia
Denmark	Serbia-Montenegro
Ecuador	Singapore
Egypt	Slovakia
Estonia	South Africa
Finland	South Korea
France	Spain
Germany	Sweden
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