

## IP Rating

The ingress protection (IP) code denotes the protection against solid objects, moisture and impact provided by the luminaire enclosure.

### Foreign body protection - 1st IP digit

Test Mark	Protection Type	Protection
	IP 1XX	Against foreign bodies $\geq$ 50 mm
	IP 2XX	Against foreign bodies $\geq$ 12 mm
	IP 3XX	Against foreign bodies $\geq$ 2.5 mm
	IP 4XX	Against foreign bodies $\geq$ 1 mm
⊞	IP 5XX	Against harmful dust deposits
⊞	IP 6XX	Against dust entry

### Water protection - 2nd IP digit

Test Mark	Protection Type	Protection
♾	IP X1X	Against drops of water falling vertically
♾	IP X2X	Against drops of water from angles up to 15°
♾	IP X3X	Against showers up to 60°
♾	IP X4X	Against splash water
♾♾	IP X5X	Against heavy downpours
♾♾	IP X6X	Against water jets
♾♾	IP X7X	Against immersion
♾♾...m	IP X8X	Against submersion

### Mechanical impact protection - 3rd IP digit

Test Mark	Protection Type	Protection
♾ 150 g	IP XX1	Impact 0,225 joule
♾ 250 g	IP XX2	Impact 0,375 joule
♾ 250 g	IP XX3	Impact 0,500 joule
♾ 500 g	IP XX5	Impact 2,00 joules
♾ 1.5 kg	IP XX7	Impact 6,00 joules
♾ 5 kg	IP XX9	Impact 20,00 joules

## Safety Symbols 17

The ENEC symbol (European Norm Electrical Certification) is a European test and certification symbol for luminaires and electrical components in luminaires. The number 17 signifies that the test/certification symbol was awarded by the Nemko Institute for Testing and Certification in Norway.

Luminaires with the F mark can be fixed to normal flame-inhibiting materials (EN60598/VDE0711).



# Electrical Characteristics

Typical electrical characteristics for lamp circuits

Lamp Type & Wattage	Starting Current (A)			Running Current (A)			Gear losses (W)	Total Circuit Watts	Power Factor	Capacitor Value (µF)	Lowest Starting Temp (°C)	Fuse (A)
	220V	230V	240V	220V	230V	240V						
<b>HID Wire Wound Circuits</b>												
<b>High Pressure Sodium</b>												
50W	0.5	0.47	0.45	0.33	0.31	0.3	15	65	> 0.9	8	-30	5
70W	0.66	0.63	0.6	0.44	0.42	0.4	16	86	> 0.9	10	-30	5
100W	0.92	0.89	0.84	0.61	0.59	0.56	23	123	> 0.9	12	-30	5
150W	1.31	1.26	1.2	0.87	0.84	0.8	25	175	> 0.9	20	-30	5
250W	2	1.9	1.8	1.35	1.3	1.24	35	285	> 0.9	35	-30	10
400W	3.1	3	2.85	2.07	1.98	1.9	45	445	> 0.9	50	-30	10
600W	4.47	4.28	4.18	3.44	3.22	3.07	91	691	0.88	60	-30	10
1000W*	Less than operating			5	4.81	4.6	85	1085	> 0.9	32(480V)***	-30	20
<b>Mercury (MBF/HPL)</b>												
50W	0.45	0.43	0.41	0.3	0.28	0.27	13	63	> 0.9	7	-20	5
80W	0.71	0.68	0.65	0.47	0.45	0.43	16	96	> 0.9	8	-20	5
125W	1.08	1.04	0.99	0.72	0.69	0.66	20	145	> 0.9	10	-20	5
250W	2	1.9	1.8	1.34	1.28	1.23	30	280	> 0.9	20	-20	10
400W	3	2.9	2.8	2	1.93	1.85	35	435	> 0.9	30	-20	10
<b>Metal Halide (MBI/HQI)</b>												
70HQI/MBI	0.66	0.63	0.6	0.44	0.42	0.4	16	86	> 0.9	10	-20	5
100HQI/MBI	0.92	0.89	0.84	0.61	0.59	0.56	23	123	> 0.9	12	-20	5
150HQI/MBI	1.31	1.26	1.2	0.87	0.84	0.8	25	175	> 0.9	20	-20	5
250HQI/MBI	2	1.9	1.8	1.35	1.3	1.24	35	285	> 0.9	35	-20	10
400HQI/MBI	3.8	3.7	3.6	2.8	2.4	2.2	40	440	> 0.9	45	-20	10
450HQI/MBI	3.8	3.7	3.6	2.28	2.26	2.2	23	477	> 0.9	50	-20	
<b>Euro Metal Halide</b>												
250W	2.4	2.3	2.2	1.6	1.5	1.5	26	310	> 0.9	20	-20	10
400W	3.4	3.1	2.9	1.9	1.9	1.8	31	406	> 0.9	30	-20	10
<b>Ceramic Metal Halide (CMH/CDM)</b>												
35CDM	0.52	0.49	0.46	0.28	0.25	0.23	11	46	> 0.9	6	-20	5
70CDM	0.74	0.71	0.67	0.52	0.48	0.46	17	87	> 0.9	10	-20	5
100CDM	0.92	0.89	0.84	0.51	0.59	0.58	23	123	> 0.9	12	-20	5
150CDM	1.53	1.46	1.41	0.85	0.81	0.79	25	175	> 0.9	20	-20	5
250CDM	2	1.9	1.8	1.35	1.3	1.24	35	285	> 0.9	35	-20	10
400CDM	3.01	2.51	2.24	2.25	2.17	2.06	48	448	> 0.9	50	-20	10
<b>Multi Vapour (MV)</b>												
175W	Less than Running			1.04	0.99	0.95	30	205	> 0.9	4	-20	
250W	Less than Running			1.35	1.29	1.24	40	290	> 0.9	10	-20	10
400W	Less than Running			2.18	2.09	2	65	465	> 0.9	25.25	-20	10
1000W	Less than Running			4.92	4.72	4.5	65	1065	> 0.9	28(480v)***	-20	20

Typical electrical characteristics for lamp circuits continued

Lamp Type & Wattage	Starting Current (A)			Running Current (A)			Gear losses (W)	Total Circuit Watts	Power Factor	Capacitor Value (µF)	Lowest Starting Temp (°C)	Fuse (A)
	220V	230V	240V	220V	230V	240V						
<b>HID Wire Wound Circuits</b>												
<b>Fluorescent PL / TRT</b>												
11W				0.06	0.06	0.05	2	13	> 0.9	2	-10	5
13W				0.07	0.07	0.07	3	16	> 0.9	2	-10	5
18W				0.12	0.11	0.11	6	24	> 0.9	3	-10	5
26W				0.16	0.15	0.14	6	32	> 0.9	3	-10	5
<b>Fluorescent PLE</b>												
23W				0.13	0.13	0.12	6	29	> 0.9	3	-10	5
<b>Fluorescent 2D</b>												
28W				0.17	0.16	0.15	6	34	> 0.9	3	-10	5
38W				0.24	0.23	0.22	10	48	> 0.9	4	-10	5

Lamp Type & Wattage	Starting Current (A)			Running Current (A)			Gear losses (W)	Total Circuit Watts	Power Factor	Capacitor Value (µF)	Lowest Starting Temp (°C)	Fuse (A)
	220V	230V	240V	220V	230V	240V						
<b>Electronic HID Ballasts</b>												
<b>Philips Cosmopolis</b>												
60W Cosmopolis White	0.19	0.17	0.2	0.32	0.31	0.3	8	66	0.95	N/A	-20	5
140W Cosmopolis White	0.44	0.37	0.41	0.71	0.7	0.66	17	152	0.96	N/A	-20	5
<b>Zodion</b>												
50W Zodion SON/CMH	Less than Running			0.26	0.25	0.24	8	56	0.987	N/A	-30(SON) / (-20(CMH))	5
70W Zodion SON/CMH	Less than Running			0.37	0.35	0.34	10	80	0.988	N/A	-30(SON) / (-20(CMH))	5
100W Zodion SON/CMH	Less than Running			0.5	0.48	0.46	13	109	0.986	N/A	-30(SON) / (-20(CMH))	5
150W Zodion SON/CMH	Less than Running			0.76	0.72	0.69	14	165	0.996	N/A	-30(SON) / (-20(CMH))	5
<b>Harvard</b>												
50W Harvard SON/CMH	Less than Running			0.25	0.24	0.23	8	56	0.991	N/A	-30(SON) / (-20(CMH))	5
70W Harvard SON/CMH	Less than Running			0.35	0.34	0.32	7	77	0.996	N/A	-30(SON) / (-20(CMH))	5
100W Harvard SON/CMH	Less than Running			0.49	0.47	0.45	8	106	0.995	N/A	-30(SON) / (-20(CMH))	5
150W Harvard SON/CMH	Less than Running			0.7	0.67	0.64	15	153	0.998	N/A	-30(SON) / (-20(CMH))	5

## Typical electrical characteristics for lamp circuits continued

Lamp Type & Wattage	Starting Current (A)			Running Current (A)			Gear losses (W)	Total Circuit Watts	Power Factor	Capacitor Value (µF)	Lowest Starting Temp (°C)	Fuse (A)
	220V	230V	240V	220V	230V	240V						
<b>Electronic HID Ballasts</b>												
<b>SELC</b>												
50W SELC SON/CMH	Less than Running			0.27	0.26	0.25	12	58	0.974	N/A	-30(SON) / (-20(CMH))	5
70W SELC SON/CMH	Less than Running			0.27	0.33	0.32	11	74	0.983	N/A	-30(SON) / (-20(CMH))	5
100W SELC SON/CMH	Less than Running			0.5	0.48	0.46	13	109	0.993	N/A	-30(SON) / (-20(CMH))	5
150W SELC SON/CMH	Less than Running			0.75	0.72	0.69	19	165	0.995	N/A	-30(SON) / (-20(CMH))	5
<b>Philips CDO - TT</b>												
Mastercity 70W	Less than Running			0.37	0.35	0.34	8	78	0.97	N/A	-20(CMH)	5
Mastercity 100W	Less than Running			0.52	0.5	0.48	10	112	0.98	N/A	-20(CMH)	5
Mastercity 150W	Less than Running			0.75	0.72	0.69	15	165	0.99	N/A	-20(CMH)	5
<b>Metrolight Super HID™</b>												
Super HID™ 50	Less than Running			0.27	0.27	0.26	7	56	0.94	N/A	-30(SON) / (-20(CMH))	5
Super HID™ 70	Less than Running			0.36	0.35	0.34	8	77	0.96	N/A	-30(SON) / (-20(CMH))	5
Super HID™ 100	Less than Running			0.51	0.49	0.47	8	112	0.98	N/A	-30(SON) / (-20(CMH))	5
Super HID™ 150	Less than Running			0.74	0.7	0.68	14	162	0.985	N/A	-30(SON) / (-20(CMH))	5
<b>Prismatron Metal Halide</b>												
*PTNG1L320 (1x320W)	Less than Running			1.6	1.5	1.4	24	339	> 0.9	N/A	-20	5
PTNG2L320 (2x320W)	Less than Running			3.1	3	2.9	16 per lamp	685	> 0.9	N/A	-20	5
*PTNG1L350 (1x350W)	Less than Running			1.7	1.6	1.6	22	369	> 0.9	N/A	-20	5
PTNG2L350 (2x350W)	Less than Running			3.4	3.3	3.2	17.5 per lamp	750	> 0.9	N/A	-20	5
*PTNG1L400 (1x400W)	Less than Running			1.9	1.9	1.8	30	422	> 0.9	N/A	-20	5
PTNG2L400 (2x400W)	Less than Running			3.9	3.7	3.6	20.5 per lamp	857	> 0.9	N/A	-20	5
<b>Fluorescent PL / TRT</b>												
32W				0.18	0.17	0.16	3	35	> 0.9	N/A	-10	5
42W				0.2	0.19	0.19	2	44	> 0.9	N/A	-10	5
57W				0.28	0.27	0.26	5	62	> 0.9	N/A	-10	5
70W				0.34	0.32	0.31	4	74	> 0.9	N/A	-10	5

Typical electrical characteristics for lamp circuits continued

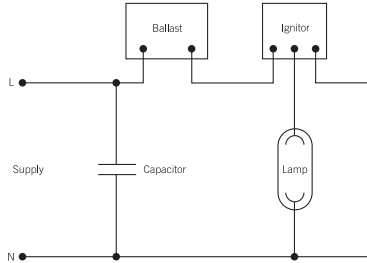
Lamp Type & Wattage	Starting Current (A)			Running Current (A)			Gear losses (W)	Total Circuit Watts	Power Factor	Capacitor Value (µF)	Lowest Starting Temp (°C)	Fuse (A)
	220V	230V	240V	220V	230V	240V						
<b>Electronic HID Ballasts</b>												
<b>Fluorescent PLL</b>												
2x55				0.52	0.5	0.48	5	115	> 0.9	N/A	-10	5
<b>Fluorescent 2D</b>												
55W				0.27	0.26	0.25	5	60	> 0.9	N/A	-10	5
<b>Fluorescent T5</b>												
2x24				0.23	0.22	0.21	5	48	> 0.9	N/A	-10	5
2x28				0.28	0.27	0.26	6	60	> 0.9	N/A	-10	5
2x39				0.37	0.35	0.35	7	82	> 0.9	N/A	-10	5
2x49				0.48	0.46	0.44	9	104	> 0.9	N/A	-10	5
<b>LED Circuits</b>												
3 WAY						0.03	3.81	7.2	0.98	N/A	-20	
6 WAY						0.032	1.34	7.6	0.98	N/A	-20	
9 WAY						0.04	0.94	11	0.98	N/A	-20	
12 WAY						0.061	2.66	14.6	0.98	N/A	-20	

The performance specification of the electrical circuits and fusing guide represents typical values obtained in accordance with accepted test methods and are subject to normal manufacturing variations of lamps, control gear and luminaires. They are issued as a technical service guide, but are subject to change without prior notice.

For the latest information please refer to [www.holophane.co.uk](http://www.holophane.co.uk)

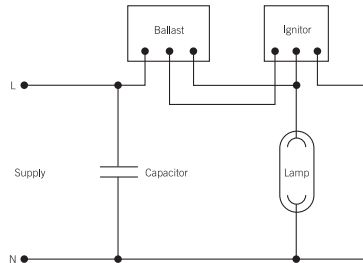
# Circuit Diagrams

1



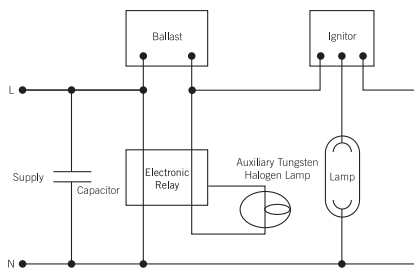
High Pressure Sodium 50 - 400 Watt  
Metal Halide 70 - 400 Watt  
Reactor & Superimposed ignitor circuit  
used for integral version

2



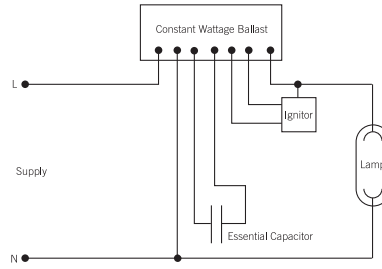
High Pressure Sodium 50 - 400 Watt  
Metal Halide 70 - 400 Watt  
Reactor & impulser ignitor circuit  
used for remote gear version to  
achieve greater starting distances

3



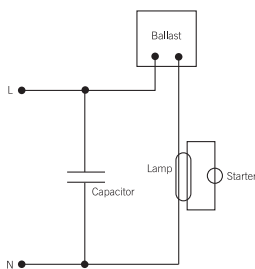
High Pressure Sodium 50 - 400 Watt  
Metal Halide 250 - 400 Watt  
Standby Relay Circuit

4



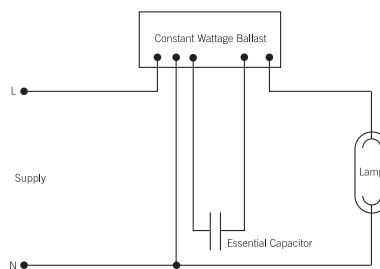
High Pressure Sodium 1000 Watt  
C.W.A Circuit & Ignitor

5



4-pin PL  
2D Fluorescent

6



Multi-Vapor 1000 Watt  
C.W.A. Circuit

For the latest information please refer to [www.holophane.co.uk](http://www.holophane.co.uk)

## Fusing Guide

### Circuit Protection for Multiple Luminaire Circuits

Within the electrical characteristics table shown on page 19.2, standard individual fuse values are quoted against each lamp type these can be used when looking to fuse individual luminaires, however we cannot recommend fuse sizes for multiple luminaires due to the individual nature of each installation.

We have no control over many variables. Therefore we would recommend that all installations are planned and installed with reference to the IEE wiring regulations (17th edition) which take effect from 1st July 2008. Using section 533 which deals with fusing, and section 599 which deals with lighting and luminaires, **and any other sections of the regulations which are relevant to the installation.**

Our only recommendation can be to use a type 'C' or better MCB, which will prevent nuisance tripping due to inrush currents.

When calculating fuse ratings please keep in mind the following points:

- High inrush current at initial switch on (as much as 25 times that of normal running current - although only for a few milliseconds)
- Running up currents
- Hot re-strike conditions
- Lamp rectifying during stabilisation and with aged lamps
- Peaks in supply voltage. In order to compensate for these high currents it is recommended to rate the protection device larger than those stated for normal running conditions.

