

H.I.D. lamps

MASTER SON (-T) with PIA technology



MASTER SON-T PIA Plus



MASTER SON PIA Plus



MASTER SON-T PIA Hg free



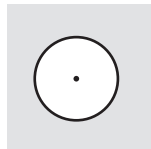
MASTER SON PIA Hg free



detail



* Philips Integrated Antenna



Burning position

PIA technology = reliability

SON is the Philips name for a range of high-quality high-pressure sodium lamps. The Philips MASTER SON(-T) PIA PLUS and the MASTER SON(-T) PIA Hg-free are high-pressure sodium lamps with PIA (Philips Integrated Antenna) technology. The sintered aluminum oxide discharge tube with integrated antenna is enclosed in a vacuum soda-lime or hard-glass outer bulb. The discharge tube of the mercury-free lamp (MASTER SON Hg free) is filled with sodium amalgam and xenon as starting gas and the discharge tube of the PLUS lamp with sodium-mercury amalgam and xenon. The 50 and 70 W have a standard E27 screw base and the 100 - 600 W a standard E40 screw base. The cap mounting of the new Philips MASTER SON PIA lamps will be lead-free which means that the lamps will be completely lead-free. The MASTER SON-T (PLUS) PIA lamps have a clear tubular outer bulb and the MASTER SON (PLUS) PIA an inside white-coated outer bulb. The lamps employ a ballast and ignitor in accordance with IEC.

MASTER SON(-T) PIA PLUS: improved efficacy

The increased pressure in the MASTER SON PIA PLUS lamps increases the luminous efficacy up to 150 lumen per watt. It is the most efficient SON lamp with the best light-technical performance resulting in the lowest energy use and therefore recommended for all new lighting installations and replacement in existing (PLUS) installations. In order to obtain this optimal efficacy and light-technical performance in combination with full retrofitability a discharge tube filling with sodium-mercury amalgam is needed. The PIA* technology, the new construction and the new ZrAl or ZrCo getter are the guarantee for a reliable operation, low early failure rate and improved lumen maintenance. The new MASTER SON(-T) PIA PLUS lamps will be lead-free.

MASTER SON(-T) PIA Hg-free: mercury-free

The new Philips MASTER SON (-T) PIA Hg-free lamps, identifiable by the green ring on the lamp envelope, are completely mercury- and lead-free. The MASTER SON PIA Hg-free lamps with newly designed discharge tubes are fully electrically retrofit in existing SON installations. Also in the MASTER SON PIA Hg-free lamps new construction and new getter result in reliable operation with a low early failure rate.

Hg free lamps are electrical retrofit in installations which fulfil to IEC requirements. Hg free lamps need a slightly higher ignition peak than traditional sodium lamps, however the required peak is far below minimum IEC requirement of 2800 V. In old installations, with ignitors with a peak not complying with IEC norm, this can give ignition problems.

All SON lamps employ a ballast and ignitor in accordance with the latest IEC HPS standard, in which it is clearly stated that all HPS lamps require luminaire protection for rectification, according EN60598-1. This is due to the risk of lamp rectification at end of lamp life, requiring luminaire protection because of overheating ballasts and ignitors. For HPS lamps this is valid for all lamps except 1000 W, SON-H .

Applications

- Road lighting
 - Motorways, Major roads and Minor roads in urban and residential areas.
- Area lighting
 - Platforms, car parks, squares and industrial areas
- Industrial lighting
- Sports facilities
 - Outdoor and indoor

H.I.D. lamps

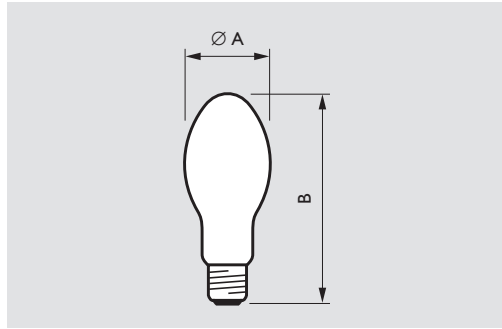
PIA* Philips Integrated Antenna technology: reliable operation with less early failures. Integrated antenna on the discharge tube makes the construction more simple and more robust. This improvement to the design completely eliminates early failures caused by the old external antenna with the bi-metallic strip. PIA stands for reliable ignition during the total use.

ZrAl or ZrCo getter: optimal lumen maintenance and low early failures.

The function of the getter is to remove impurities in the vacuum of the outer bulb ensuring an optimal functioning and light output throughout the lifetime of the lamp. The early failures due to the old Barium getter are completely eliminated.

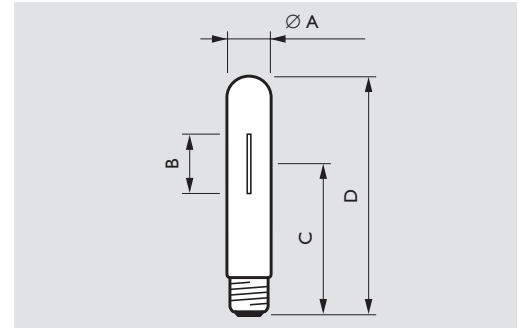
New construction with less welding points: less early failures. The new construction with less components and welds extends the life of the lamp as it is more robust and thus more resistant to vibrations and shocks.

MASTER SON (-T) with PIA technology



Dimensions in mm

Type	A max.	B max.
Cap/base E27		
MASTER SON PIA 50W/70W	71.0	156.0
Cap/base E40		
MASTER SON PIA Plus 100W	76.0	186.0
MASTER SON PIA (Plus) 150W,250W	91.0	226.0
MASTER SON PIA (Plus) 400W	122.0	290.0

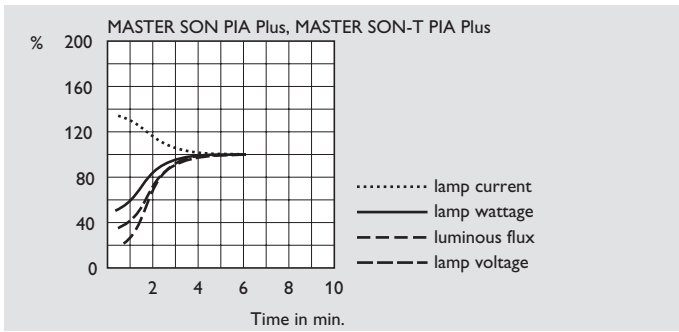


Type	A max.	B max.	C	D max.
Cap/base E27				
MASTER SON-T PIA Plus 50W	32.0	35.0	102.0	156.0
MASTER SON-T PIA Plus 70W	32.0	42.0	102.0	156.0
Cap/base E40				
MASTER SON-T PIA Plus 100W	47.0	47.0	132.0	211.0
MASTER SON-T PIA 100W	47.0	70.0	132.0	211.0
MASTER SON-T PIA Plus 150W	47.0	61.0	132.0	211.0
MASTER SON-T PIA 150W	47.0	73.0	132.0	211.0
MASTER SON-T PIA Plus 250W	47.0	64.0	158.0	257.0
MASTER SON-T PIA 250W	47.0	82.0	158.0	257.0
MASTER SON-T PIA 400W	47.0	111.0	175.0	283.0
MASTER SON-T PIA Plus 600W	47.0	126.0	175.0	283.0

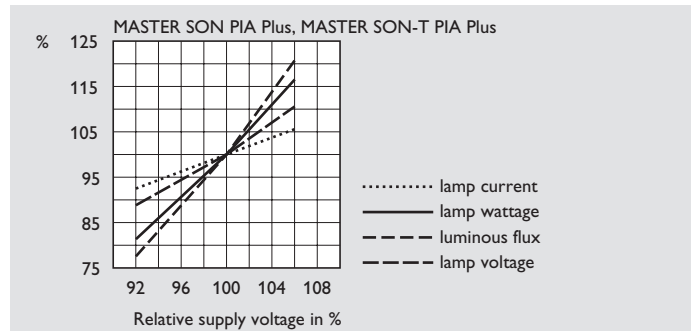


Commercial name	Wattage W	Cap/ base	External Starter	Finish	Lamp wattage W	Lamp voltage V	Lamp current A	Lumen output lm	Efficacy source lm/W	Correlated colour temp. K
MASTER SON-T PIA PLUS										
MASTER SON-T PIA PLUS	50	E27	E	CLEAR	50	88	0.75	4400	88	2000
MASTER SON-T PIA PLUS	70	E27	E	CLEAR	70	90	1.00	6600	94	2000
MASTER SON-T PIA PLUS	100	E40	E	CLEAR	100	100	1.20	10500	105	2000
MASTER SON-T PIA PLUS	150	E40	E	CLEAR	150	100	1.80	16500	110	2000
MASTER SON-T PIA PLUS	250	E40	E	CLEAR	250	100	3.00	32000	128	2000
MASTER SON-T PIA PLUS	400	E40	E	CLEAR	400	100	4.50	55000	138	2000
MASTER SON-T PIA PLUS	600	E40	E	CLEAR	600	115	5.80	90000	150	2000
MASTER SON PIA PLUS										
MASTER SON PIA PLUS	100	E40	E	COATED	100	100	1.20	10000	100	2000
MASTER SON PIA PLUS	150	E40	E	COATED	152	100	1.80	16000	107	2000
MASTER SON PIA PLUS	250	E40	E	COATED	250	105	2.85	30000	120	2000
MASTER SON PIA PLUS	400	E40	E	COATED	400	105	4.50	54000	135	2000
MASTER SON-T PIA										
MASTER SON-T PIA Hg free	100	E40	E	CLEAR	100	98	1.24	8800	88	2150
MASTER SON-T PIA Hg free	150	E40	E	CLEAR	150	98	1.80	15000	100	2150
MASTER SON-T PIA Hg free	250	E40	E	CLEAR	250	100	3.00	28000	110	2150
MASTER SON-T PIA Hg free	400	E40	E	CLEAR	400	98	4.60	48000	120	2150
MASTER SON PIA										
MASTER SON PIA	50	E27	E	COATED	50	90	0.76	3500	70	2000
MASTER SON PIA	70	E27	E	COATED	70	90	0.98	5600	80	2000
MASTER SON PIA Hg free	150	E40	E	COATED	150	98	1.80	14500	97	2150
MASTER SON PIA Hg free	250	E40	E	COATED	250	100	3.00	27000	108	2150
MASTER SON PIA Hg free	400	E40	E	COATED	400	98	4.60	48000	120	2150

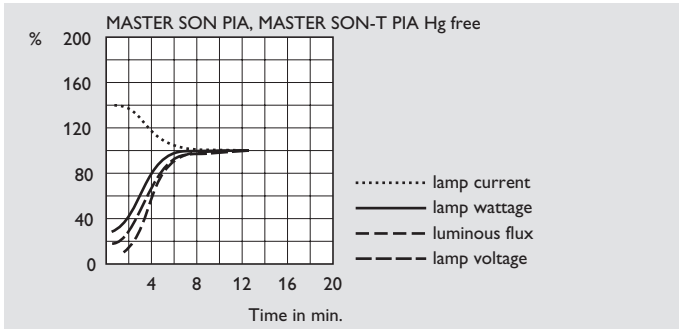
Commercial name	Wattage W	Cap/ base	External Starter	Chromaticity coordinate x	Chromaticity coordinate y	Colour rendering index	Maximum permissible base/pinch temp. degr.C	Maximum permissible bulb temp. degr.C	Nett weight g	EOC
MASTER SON-T PIA PLUS										
MASTER SON-T PIA PLUS	50	E27	E	540	420	23	200	350	51	192653
MASTER SON-T PIA PLUS	70	E27	E	540	420	23	200	350	52	192660
MASTER SON-T PIA PLUS	100	E40	E	535	420	23	250	450	160	192301
MASTER SON-T PIA PLUS	150	E40	E	535	420	23	250	450	155	192295
MASTER SON-T PIA PLUS	250	E40	E	530	420	23	250	450	175	179876
MASTER SON-T PIA PLUS	400	E40	E	525	425	23	250	450	190	179883
MASTER SON-T PIA PLUS	600	E40	E	524	426	23	250	450	190	197429
MASTER SON PIA PLUS										
MASTER SON PIA PLUS	100	E40	E	535	420	23	200	350	110	182258
MASTER SON PIA PLUS	150	E40	E	535	420	23	250	350	180	182289
MASTER SON PIA PLUS	250	E40	E	530	420	23	250	350	180	193445
MASTER SON PIA PLUS	400	E40	E	525	425	23	250	350	240	193452
MASTER SON-T PIA										
MASTER SON-T PIA Hg free	100	E40	E	525	436	23	250	450	160	201379
MASTER SON-T PIA Hg free	150	E40	E	525	436	23	250	350	155	200617
MASTER SON-T PIA Hg free	250	E40	E	516	436	23	250	450	175	200594
MASTER SON-T PIA Hg free	400	E40	E	519	436	23	250	450	190	200631
MASTER SON PIA										
MASTER SON PIA	50	E27	E	540	415	23	200	350	60	201447
MASTER SON PIA	70	E27	E	540	415	23	200	350	60	201461
MASTER SON PIA Hg free	150	E40	E	525	436	23	250	350	185	200570
MASTER SON PIA Hg free	250	E40	E	516	436	23	250	350	185	200556
MASTER SON PIA Hg free	400	E40	E	519	436	23	250	350	240	200532



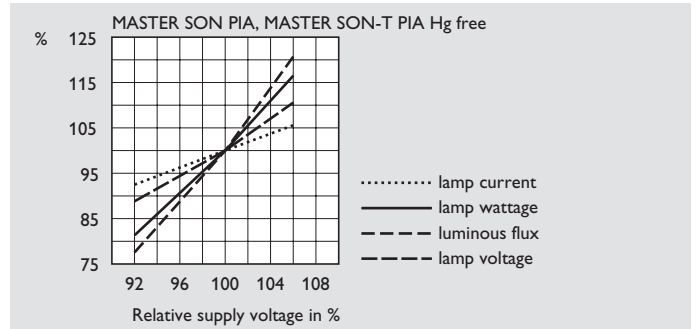
Lamp performance during run-up



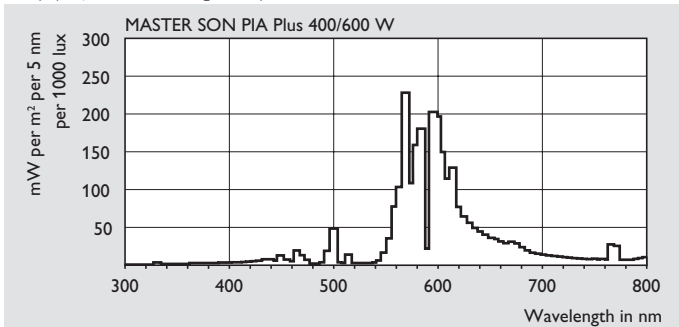
Effects of main voltage variations



Lamp performance during run-up



Effects of main voltage variations



Spectral power distributions