



Philips MASTER LEDtube 1200mm & 1500mm Technical Application Guide



PHILIPS



MASTER LEDtube is a reliable value-for-money LED lamp out of Philips lighting portfolio, incorporates frontier LED chips and other advanced technologies. It also helps generate more than 55% energy saving and significant maintenance cost reduction by comparing to fluorescent lamps. It also helps generate natural and comfortable lighting effect, and to build up green and environment friendly image for our customers.

Product Features

Highly Reliable

- Ultra Output for Ultra efficiency --> designed to comply with key industry standards like UGR and Lux levels
- Reliable operation between -20 °C to 35 °C ambient temperature
- Rated average life of 50,000 hours (tested to F50 L70 requirement)
- 200,000 switching cycles

Highly Comfortable

- CRI 83
- Advanced optical design ensures a uniform light output and superior optical efficiency

Perfect Fit

- 100% comply with IEC requirement on T8 dimension, fitting into fluorescent luminaire perfectly

Highly Energy Efficient

- Energy savings of more than 55%*
- Efficacy up to 148lm/W to get A++ energy label in EU

Highly Safe

- Protection circuit inside ensuring people's safety in case of mis-use, complying with IEC safety requirements
- Pass 4KV high-pot test, insulation & safety guaranteed
- Pass 1KV surge test (vs. IEC standard 500V), avoiding the damage caused by input voltage fluctuation and lightning strike

Highly Environmental Friendly

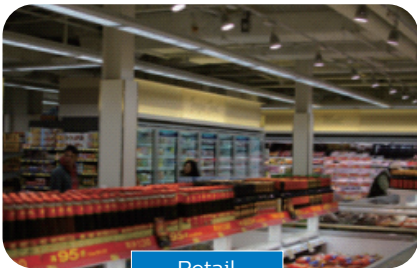
- No mercury
- No breakage and pollution risk

Rotatable end-cap

- To ensure maximum compatibility with existing luminaires, directional LEDtubes often need to be adjusted towards where light is needed most. That's why Philips MASTER products have this feature. It allows the LEDtube to be easily rotated up to 90 degrees, giving you the freedom to direct the light to best effect.

* Based on comparison between Philips 18W & 25W MASTER LEDtube and Philips TLD standard 36W (40-44W system power consumption) & 58W

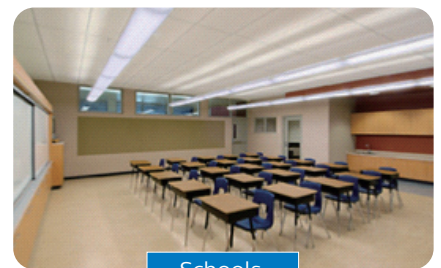
Application



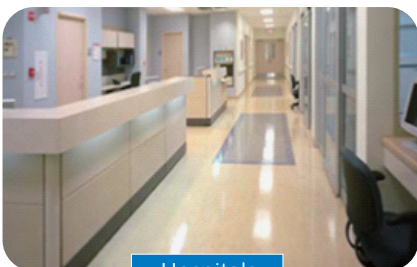
Retail



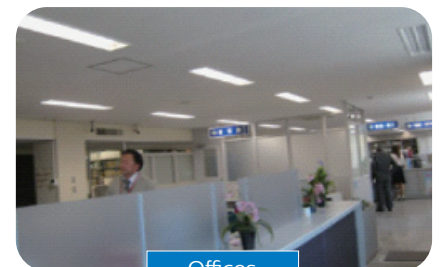
Industry



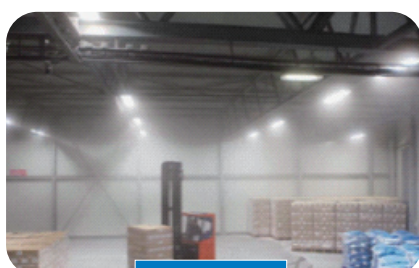
Schools



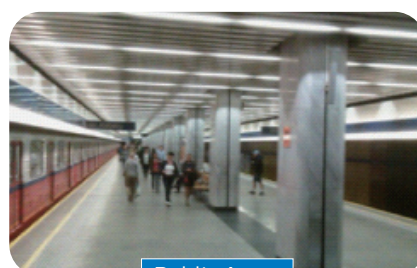
Hospitals



Offices



Warehouses



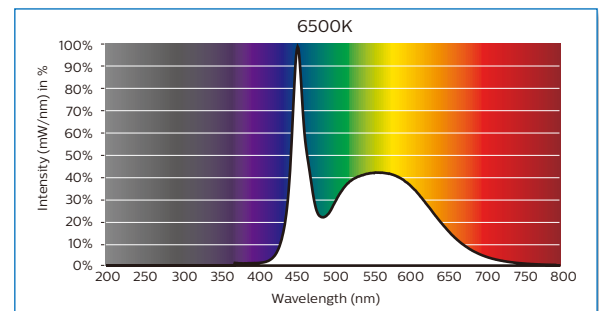
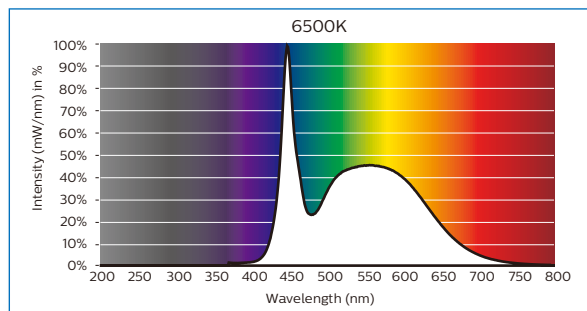
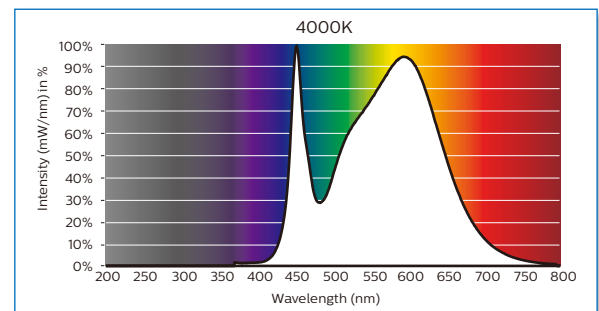
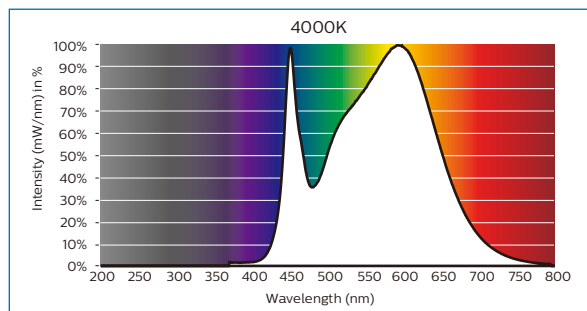
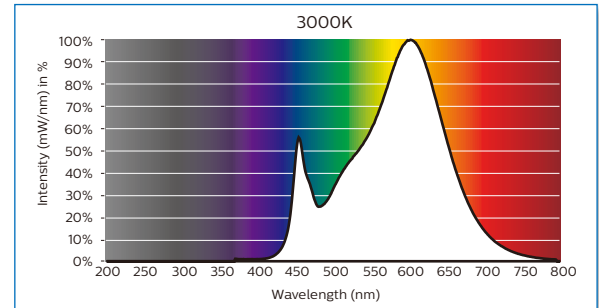
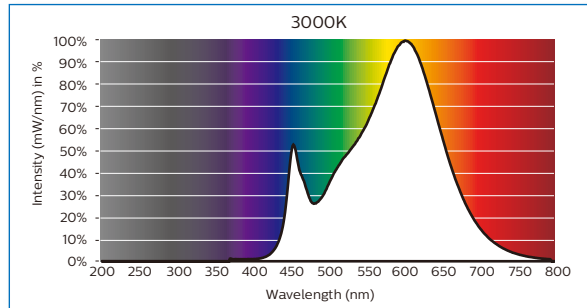
Public Areas

Spectral Power Distribution

Light may be precisely characterized by giving the power of the light at each wavelength in the visible spectrum. The resulting spectralpower distribution (SPD) shows that the MASTER LEDtube 1200 & 1500 mm Ultra Output contains the visible light only. No harm from UV and IR.

1200 mm 18W

1500 mm 25W

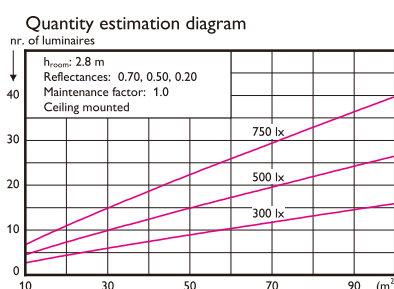
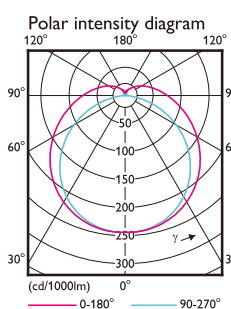


Photometric Diagrams

The Photometric diagram depicting the top down mounted lighting fixtures in a specific area and a numerical grid of the maintained lighting levels that the fixture will produce in that specific area. Pictures below show the photometric diagrams of a typical Philips Master LEDtube's application.

1 x TLED 18W 3000K160D

1 x 2300 lm



Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80	0.80	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.00	0.00	0.00
0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.45	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.54	0.49	0.45	
2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	
5.00	1.07	0.92	1.01	0.95	0.89	0.85	0.81	0.78	0.77	0.75	0.68	

Ceiling mounted

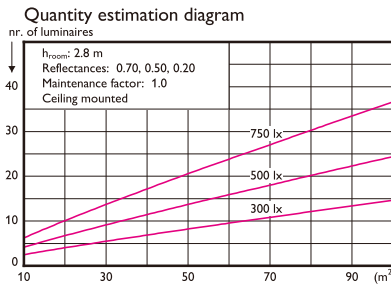
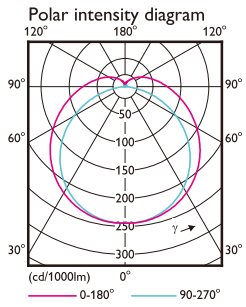
Luminance Table

Plane Core	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	9058	9176	9515	10091	11033	12015	15489
50.0	8482	8594	8923	9470	10367	11344	15080
55.0	7930	8037	8351	8857	9681	10649	14541
60.0	7405	7507	7804	8258	8980	10049	13868
65.0	6913	7006	7281	7676	8269	9099	12984
70.0	6458	6543	6798	7125	7573	8236	11776
75.0	6048	6123	6355	6617	6900	7471	10123
80.0	5688	5754	5964	6164	6283	5972	7659
85.0	5385	5442	5634	5783	5767	4892	4179
90.0	5149	5196	5375	5491	5429	4215	383

(cd/m²)

1 x TLED 18W 4000K160D

1 x 2500 lm



Utilisation factor table

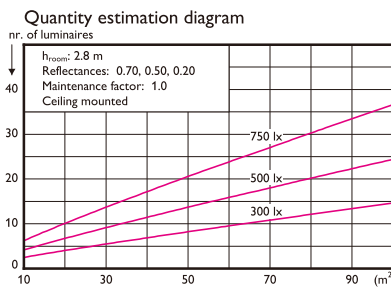
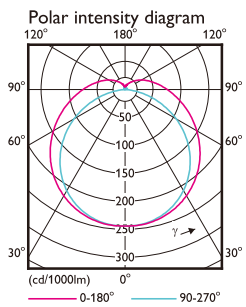
Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)														
	0.80			0.70			0.50			0.30			0.00		
	0.80	0.80	0.80	0.70	0.70	0.70	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	0.20	0.10	0.10	0.00
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	0.27	0.13	0.12	0.00
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	0.31	0.15	0.14	0.00
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.45	0.40	0.37	0.17	0.16	0.00
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.54	0.49	0.45	0.42	0.19	0.18	0.00
2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	0.48	0.23	0.22	0.00
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	0.53	0.26	0.25	0.00
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	0.57	0.28	0.27	0.00
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	0.61	0.30	0.29	0.00
5.00	1.07	0.92	1.01	0.95	0.89	0.85	0.81	0.78	0.77	0.75	0.68	0.64	0.31	0.30	0.00

Luminance Table

Plane Cose	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	9847	9973	10343	10970	11994	13712	16814
50.0	9221	9341	9699	10294	11267	12982	16371
55.0	8620	8736	9077	9627	10524	12165	15808
60.0	8048	8161	8481	8975	9760	11252	15075
65.0	7514	7616	7916	8344	8991	10214	14111
70.0	7020	7111	7390	7745	8232	9060	12798
75.0	6573	6656	6907	7194	7498	7794	11001
80.0	6181	6255	6483	6701	6829	6491	8325
85.0	5852	5913	6123	6288	6268	5317	4529
90.0	5595	5648	5839	5970	5899	4580	383

1 x TLED 18W 6500K160D

1 x 2500 lm



Utilisation factor table

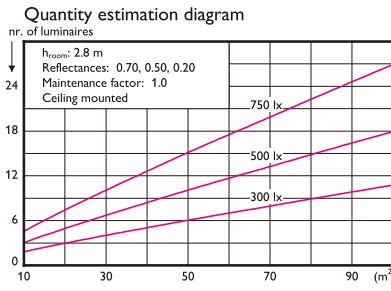
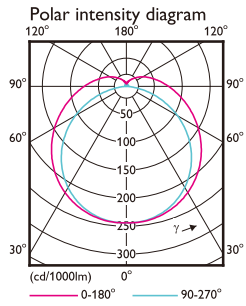
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0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	0.20	0.10	0.10	0.00
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	0.27	0.13	0.12	0.00
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2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	0.48	0.23	0.22	0.00
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	0.53	0.26	0.25	0.00
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	0.57	0.28	0.27	0.00
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	0.61	0.30	0.29	0.00
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Luminance Table

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55.0	8620	8736	9077	9627	10524	12165	15808
60.0	8048	8161	8481	8975	9760	11252	15075
65.0	7514	7616	7916	8344	8991	10214	14111
70.0	7020	7111	7390	7745	8232	9060	12798
75.0	6573	6656	6907	7194	7498	7794	11001
80.0	6181	6255	6483	6701	6829	6491	8325
85.0	5852	5913	6123	6288	6268	5317	4529
90.0	5595	5648	5839	5970	5899	4580	383

1 x TLED 25W 3000K160D

1 x 3400 lm



Utilisation factor table

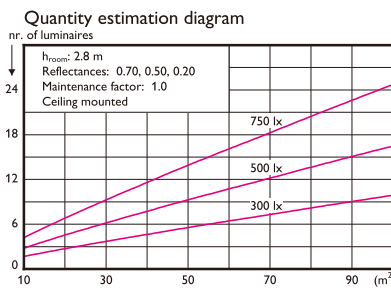
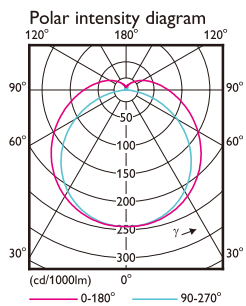
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	0.80	0.80	0.80	0.70	0.70	0.70	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	0.20	0.10	0.10	0.00
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	0.27	0.13	0.12	0.00
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	0.31	0.15	0.14	0.00
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.45	0.40	0.37	0.17	0.16	0.00
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.54	0.49	0.45	0.42	0.19	0.18	0.00
2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	0.48	0.23	0.22	0.00
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	0.53	0.26	0.25	0.00
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	0.57	0.28	0.27	0.00
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	0.61	0.30	0.29	0.00
5.00	1.07	0.92	1.01	0.95	0.89	0.85	0.81	0.78	0.77	0.75	0.68	0.64	0.31	0.30	0.00

Luminance Table

Plane Cose	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	10713	10857	11267	11958	13083	14972	18375
50.0	10032	10170	10567	11222	12297	14182	17907
55.0	9379	9511	9892	10499	11489	13295	17309
60.0	8757	8885	9243	9788	10658	12305	16523
65.0	8175	8292	8637	9104	9821	11183	15488
70.0	7637	7744	8055	8451	8996	9928	14098
75.0	7152	7247	7531	7852	8202	8851	12169
80.0	6727	6813	7067	7317	7475	7136	9274
85.0	6367	6442	6677	6869	6865	5855	5156
90.0	6088	6153	6373	6523	6467	5065	510

1 x TLED 25W 4000K160D

1 x 3700 lm

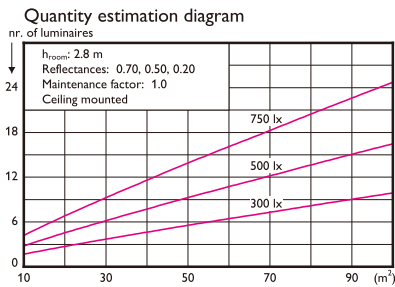
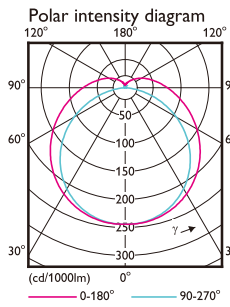


Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)														
	0.80			0.70			0.50			0.30			0.00		
	0.80	0.80	0.80	0.70	0.70	0.70	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	0.20	0.10	0.10	0.00
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	0.27	0.13	0.12	0.00
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	0.31	0.15	0.14	0.00
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.45	0.40	0.37	0.17	0.16	0.00
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.54	0.49	0.45	0.42	0.19	0.18	0.00
2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	0.48	0.23	0.22	0.00
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	0.53	0.26	0.25	0.00
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	0.57	0.28	0.27	0.00
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	0.61	0.30	0.29	0.00
5.00	1.07	0.92	1.01	0.95	0.89	0.85	0.81	0.78	0.77	0.75	0.68	0.64	0.31	0.30	0.00

Luminance Table

Plane Cose	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	11659	11816	12261	13013	14238	16292	19998
50.0	10918	11067	11499	12213	13382	15434	19487
55.0	10206	10350	10764	11425	12502	14470	18838
60.0	9531	9669	10059	10654	11598	13389	17990
65.0	8897	9023	9397	9988	10888	12469	16868
70.0	8311	8429	8765	9198	9788	10802	15343
75.0	7784	7887	8195	8545	8925	9307	13236
80.0	7319	7414	7692	7962	8135	7765	10093
85.0	6930	7012	7266	7474	7471	6376	5606
90.0	6626	6696	6933	7100	7039	5513	638



Utilisation factor table

Room Index k	Reflectances (%) for ceiling, walls and working plane (CIE)											
	0.80	0.80	0.70	0.70	0.70	0.70	0.50	0.50	0.30	0.30	0.30	0.00
0.60	0.43	0.41	0.42	0.41	0.40	0.32	0.31	0.26	0.29	0.25	0.22	
0.80	0.53	0.50	0.51	0.50	0.48	0.40	0.39	0.33	0.37	0.32	0.29	
1.00	0.61	0.57	0.59	0.57	0.55	0.47	0.45	0.40	0.43	0.38	0.34	
1.25	0.69	0.63	0.66	0.64	0.61	0.54	0.51	0.46	0.49	0.45	0.40	
1.50	0.75	0.68	0.72	0.69	0.66	0.59	0.56	0.51	0.54	0.49	0.45	
2.00	0.85	0.76	0.81	0.77	0.74	0.67	0.64	0.60	0.61	0.57	0.52	
2.50	0.91	0.81	0.87	0.83	0.78	0.73	0.69	0.65	0.66	0.62	0.57	
3.00	0.96	0.84	0.92	0.87	0.82	0.77	0.73	0.69	0.69	0.66	0.61	
4.00	1.03	0.89	0.98	0.92	0.86	0.82	0.78	0.75	0.74	0.71	0.65	
5.00	1.07	0.92	1.01	0.95	0.89	0.85	0.81	0.78	0.77	0.75	0.68	

Ceiling mounted

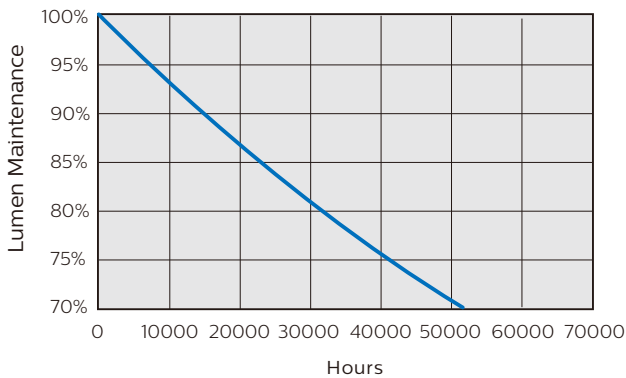
Luminance Table

Plane Cone	0.0	15.0	30.0	45.0	60.0	75.0	90.0
45.0	11659	11816	12261	13013	14238	16292	19998
50.0	10918	11067	11499	12213	13382	15434	19487
55.0	10206	10350	10764	11425	12502	14470	18838
60.0	9531	9669	10059	10654	11598	13389	17990
65.0	8897	9023	9387	9907	10688	12169	16868
70.0	8311	8429	8765	9198	9788	10802	15343
75.0	7784	7887	8195	8545	8925	9307	12236
80.0	7319	7414	7692	7962	8135	8135	10093
85.0	6930	7012	7266	7474	7471	6376	5606
90.0	6626	6696	6933	7100	7029	5513	438

(cd/m²)

Lifetime and Lumen Maintenance

1200mm 18W/ 1500mm 25W



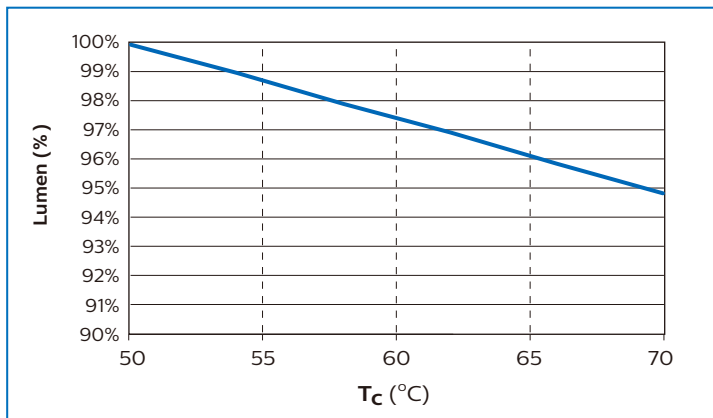
PHILIPS MASTER LEDtube has a lifetime of 50,000 hours, defined as the number of hours when 50% of a large group of identical lamps below 70% of its initial lumen (F50L70).

Temperature

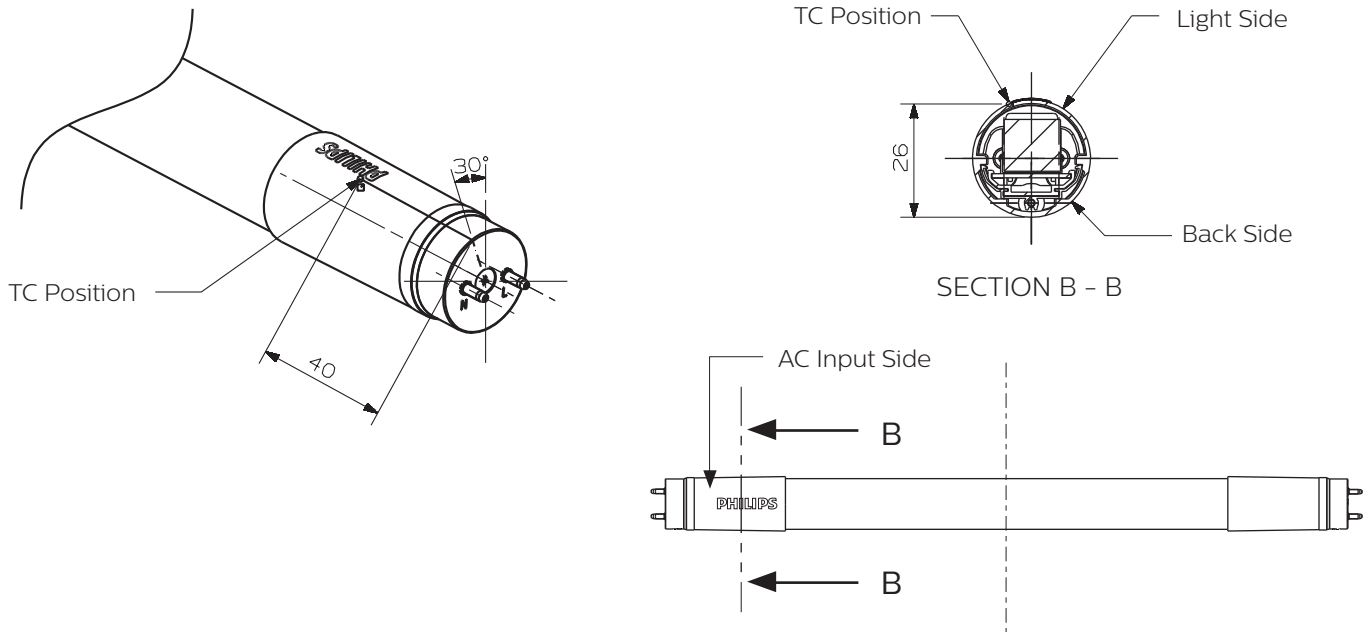
MASTER LEDtube's excellent thermal design ensures low temperature during operating, which brings reliable and stable product performance throughout life time.

Operating temperature	T operating	min -20°C	max +35°C
Storage temperature	T storage	min -40°C	max +65°C
Maximum case temperature of tube at Tamb =25°C	T case		+50°C (1200 mm)
Maximum case temperature of tube at Tamb = 25°C	T case		+50°C (1500 mm)

1200mm 18W/ 1500mm 25W



1200mm_18W/ 1500mm_25W (Dimension:mm)



Approbation & Certificates

Philips MASTER LEDtube is designed by strictly following applicable legislation and international standard. The product complies with **CE, KEMA, TUV, RoHS** and **REACH**.

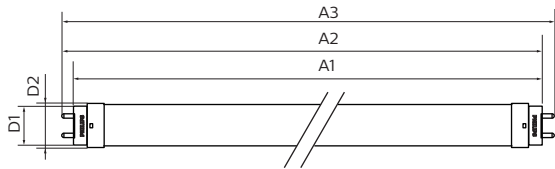
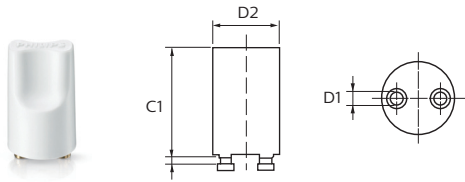


Technical specification

10NC	Product Description	Lamp Wattage	Equivalent Fluorescent Wattage	Voltage	Cap	Length	Beam angle	Lifetime	Lumen output (Typical)	Color Temp	CRI
		(W)	(W)	(V)		(mm)	(°)	(hrs)	(lm)	(K)	(Typical)*
9290011488	MAS LEDtube 1200mm UO 18W 830 T8 RS	18	36	220-240	G13	1200	160	50,000	2300	3000	83
9290012219	MAS LEDtube 1200mm UO 18W 830 T8 RN	18	36	220-240	G13	1200	160	50,000	2300	3000	83
9290011489	MAS LEDtube 1200mm UO 18W 840 T8 RS	18	36	220-240	G13	1200	160	50,000	2500	4000	83
9290012220	MAS LEDtube 1200mm UO 18W 840 T8 RN	18	36	220-240	G13	1200	160	50,000	2500	4000	83
9290011490	MAS LEDtube 1200mm UO 18W 865 T8 RS	18	36	220-240	G13	1200	160	50,000	2500	6500	83
9290012221	MAS LEDtube 1200mm UO 18W 865 T8 RN	18	36	220-240	G13	1200	160	50,000	2500	6500	83
9290011491	MAS LEDtube 1500mm UO 25W 830 T8	25	58	220-240	G13	1500	160	50,000	3400	3000	83
9290011492	MAS LEDtube 1500mm UO 25W 840 T8	25	58	220-240	G13	1500	160	50,000	3700	4000	83
9290011493	MAS LEDtube 1500mm UO 25W 865 T8	25	58	220-240	G13	1500	160	50,000	3700	6500	83

* Minimum CRI is 80

EMP



Accessories

MASTER LEDtube

Protector EMP

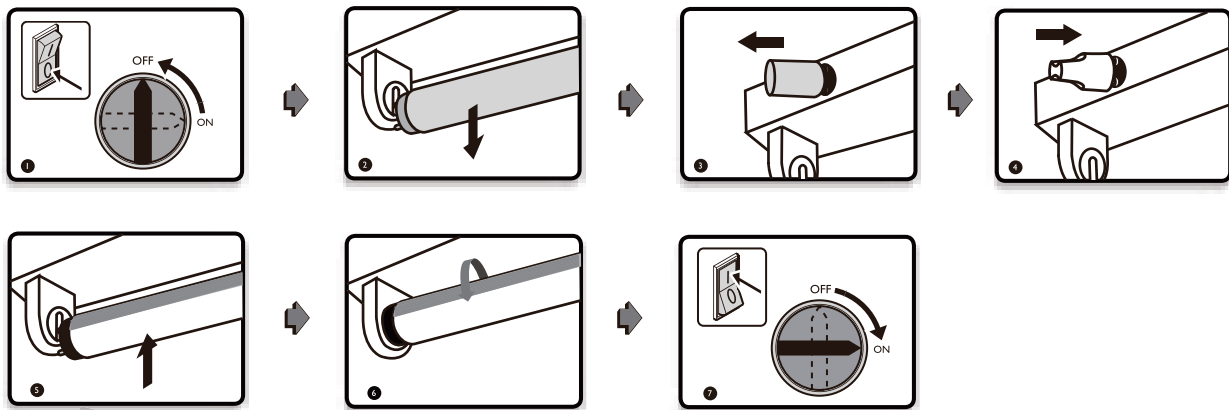
871829172930300

Dimensions (mm)

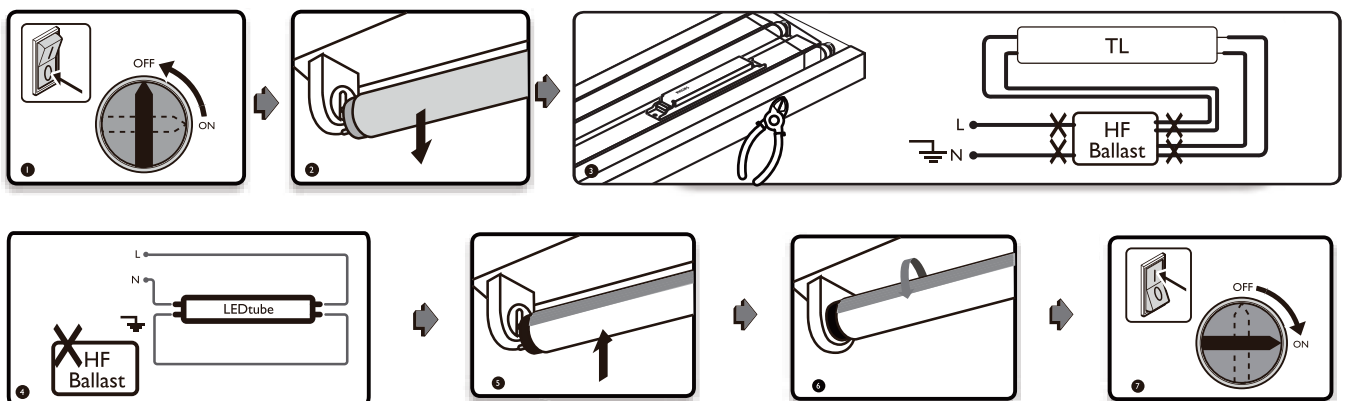
Product	A1	A2	A3	C1	D1	D2
1200mm	1198	1205	1211	-	25.68	28
1500mm	1500	1507	1514	-	25.68	28
EMP	-	-	-	34.5	3	21.5

Installation Guide

• EM ballast based system



• HF ballast based system



Note: for twin lamp series configuration and more detailed information please visit: www.philips.com/led-product-info

Maximum amount of Master LED tube connected on one circuit breaker

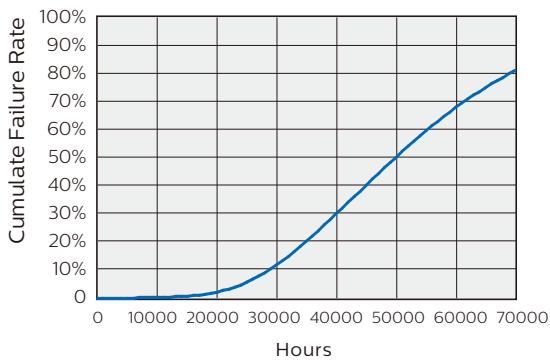
MCB B Type	Wiring Type	Master TLED	
		1200 mm	1500 mm
16A	Mains	110	93
	EM	110	93
	EM + Comp. Cap.	14	15
10A	Mains	68	58
	EM	68	58
	EM + Comp. Cap.	8	9

Parallel Power factor compensation capacitors are expected not to cause any problems with LED tubes, but larger Parallel Power factor compensation capacitors to correct inductive reactive power load are recommended to be removed

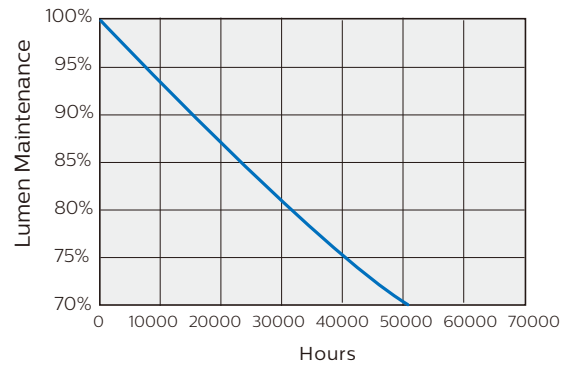
OEM Guideline

1200mm / 1500mm

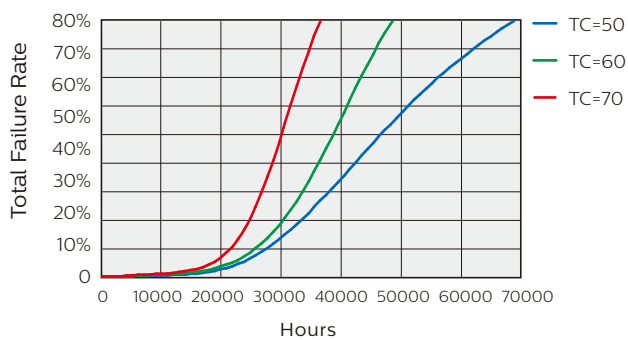
Lifetime Curve



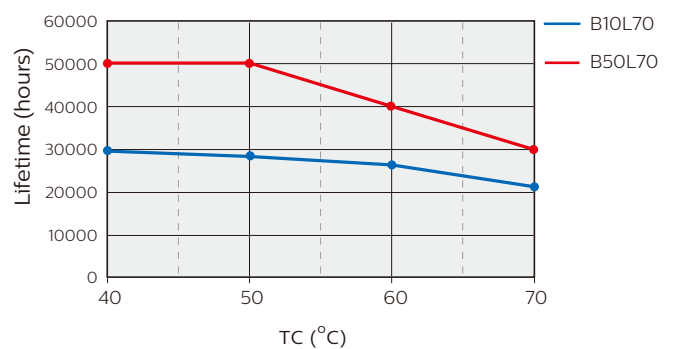
Lifetime and Lumen Maintenance



Failure Rate vs. Lifetime vs. Tcase



Lifetime vs. Tcase



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03/2016

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