

LongLast™

Biax™ L

Compact Fluorescent Lamps Non-Integrated 18W, 24W, 34W, 36W, 40W, 55W

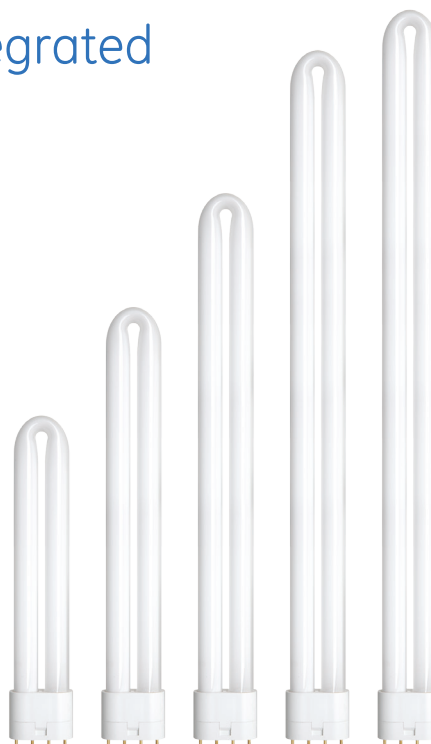
DATA SHEET

Product information

Biax™ L covers a range of single ended compact fluorescent lamps with high lumen output and are available in a wide range: 18, 24, 34, 36, 40, 55 watt versions.

The single ended design is less than half the length of standard fluorescent lamps. This makes Biax™ L the ideal choice for modular luminaires. The range is available in colours of 2700, 3000, 3500, 4000K and 6500K allowing use in most environments.

All Biax™ L lamps have a CRI of 82. The family of Biax™ L lamps offers a rated life of 15,000 hours for 18W to 36W and 22,500 hours for 40 and 55W. The 40 and 55W versions are for use on high-frequency electronic gear only.



Features

- Compact, wide range of wattages
- High lumen package
- Increased surface brightness enabling improved optical control
- Excellent colour rendering – 82Ra
- Lamps can be used with dimmable electronic gear and emergency modules
- Low mercury content

Application areas

- Compact size is ideal for modular luminaires in commercial premises, shops, offices and hotels.
- Alternative use in non-general lighting applications such as task lights and sign lights.
- The 34W lamp offers an economical alternative to the 40W from an installation point of view while having the same physical dimensions. It is essential to use suitable electronic gear, or electronic starter when operating the 34W lamp with conventional gear.
- The 40 watt lamp has been specifically designed for optimum performance when used with high-frequency control gear.
- The 55 watt lamp offers 4,800 lumens in the same overall length as the 40 watt, ideal for use where higher lumens are required.



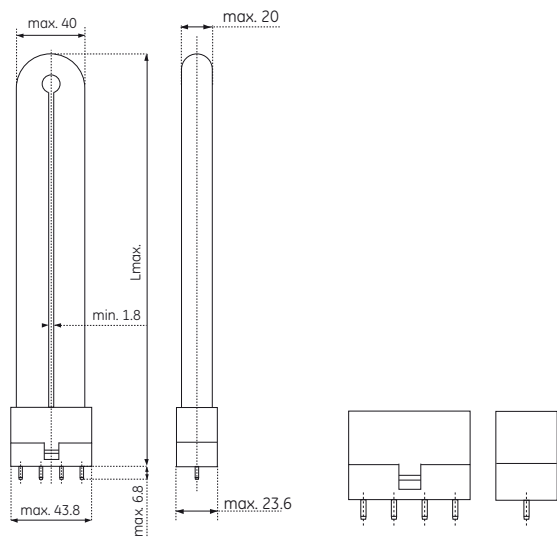
GE imagination at work

Basic data

Nominal Wattage [W]	Rated Wattage on Standard Gear [W]	Energy consumption [kWh/1000h]	Volts on Standard Gear [V]	Cap	Product Description	Product Code	Nominal Lumen [lm]	Rated Lumen [lm]	Rated Lamp Efficacy on Standard Gear [lm/W]	CCT [K]	CRI [Ra]	Mercury [mg]	Life on Electronic Gear 12h-cycle [h]	Diameter [mm]	Length [mm]	Length Without Pins	EEC	Pack Qty
Biax™ L LongLast™ 4-pin, External Starter Required																		
18	18	17.60	58	2G11	F18BX/827	41087	1250	1250	69	2700	82	1.3	15,000	43.8	231.3	224.5	A	25
18	18	17.60	58	2G11	F18BX/830	41088	1250	1250	69	3000	82	1.3	15,000	43.8	231.3	224.5	A	25
18	18	17.60	58	2G11	F18BX/835	41089	1250	1250	69	3500	82	1.3	15,000	43.8	231.3	224.5	A	25
18	18	17.60	58	2G11	F18BX/840	41090	1250	1250	69	4000	82	1.3	15,000	43.8	231.3	224.5	A	25
24	24	24.20	87	2G11	F24BX/827	41128	1800	1800	75	2700	82	1.3	15,000	43.8	326.8	320	A	25
24	24	24.20	87	2G11	F24BX/830	41134	1800	1800	75	3000	82	1.3	15,000	43.8	326.8	320	A	25
24	24	24.20	87	2G11	F24BX/835	41145	1800	1800	75	3500	82	1.3	15,000	43.8	326.8	320	A	25
24	24	24.20	87	2G11	F24BX/840	41155	1800	1800	75	4000	82	1.3	15,000	43.8	326.8	320	A	25
34	34	33.00	120	2G11	F34BX/830	41163	2800	2800	82	3000	82	1.3	15,000	43.8	538.8	532	A+	25
34	34	33.00	120	2G11	F34BX/835	41166	2800	2800	82	3500	82	1.3	15,000	43.8	538.8	532	A+	25
34	34	33.00	120	2G11	F34BX/840	41167	2800	2800	82	4000	82	1.3	15,000	43.8	538.8	532	A+	25
36	36	36.52	106	2G11	F36BX/827	41307	2900	2900	81	2700	82	1.3	15,000	43.8	421.8	415	A+	25
36	36	36.52	106	2G11	F36BX/830	41168	2900	2900	81	3000	82	1.3	15,000	43.8	421.8	415	A+	25
36	36	36.52	106	2G11	F36BX/835	41169	2900	2900	81	3500	82	1.3	15,000	43.8	421.8	415	A+	25
36	36	36.52	106	2G11	F36BX/840	41170	2900	2900	81	4000	82	1.3	15,000	43.8	421.8	415	A+	25
36	36	36.52	106	2G11	F36BX/865	75694	2750	2750	76	6500	82	1.3	15,000	43.8	421.8	415	A	25

Nominal Wattage [W]	Rated Wattage on Electronic Gear [W]	Energy consumption [kWh/1000h]	Volts on Electronic Gear [V]	Cap	Product Description	Product Code	Nominal Lumen [lm]	Rated Lumen [lm]	Rated Lamp Efficacy on Electronic Gear [lm/W]	CCT [K]	CRI [Ra]	Mercury [mg]	Life on Electronic Gear 12h-cycle [h]	Diameter [mm]	Length [mm]	Length Without Pins	EEC	Pack Qty
Biax™ L LongLast™ 4-pin, External Starter Required																		
40	40	44.00	126	2G11	F40BX/830	41171	3500	3500	88	3000	82	1.3	22,500	43.8	538.8	532	A	25
40	40	44.00	126	2G11	F40BX/835	41172	3500	3500	88	3500	82	1.3	22,500	43.8	538.8	532	A	25
40	40	44.00	126	2G11	F40BX/840	41173	3500	3500	88	4000	82	1.3	22,500	43.8	538.8	532	A	25
55	55	60.50	101	2G11	F55BX/830	41174	4800	4800	87	3000	82	1.3	22,500	43.8	538.8	532	A	25
55	55	60.50	101	2G11	F55BX/835	41260	4800	4800	87	3500	82	1.3	22,500	43.8	538.8	532	A	25
55	55	60.50	101	2G11	F55BX/840	41298	4800	4800	87	4000	82	1.3	22,500	43.8	538.8	532	A	25
55	55	60.50	101	2G11	F55BX/865	75695	4550	4550	83	6500	82	1.3	22,500	43.8	538.8	532	A	25

Dimensions



Rated Power	L max. [mm]
18	225
24	320
34	532
36	415
40	532
55	532

Lamp life

Rated average life for Biax™ L lamps is 15,000 hours for 18W to 36W and 20,000 hours for 40W, 55W (switching cycle: 3 Hrs: 165 Mins ON/15 Mins OFF).

Biax™ Life on electronic gear 12h cycle (h)

Hours	Survival rate 3h	Lumen maintenance
100	1	1
2,000	1.00	0.93
4,000	0.96	0.89
6,000	0.87	0.86
8,000	0.71	0.83
15,000	0.50	0.81

Lumen maintenance

Lumen maintenance curve presented for Biax™ L lamps is based on lumen readings in a photometric sphere under laboratory conditions, with lamp operated horizontally. In actual use, lumen output is a function of burning hours throughout life.

Biax™ L 40-55W on electric gear 3 and 12 hours

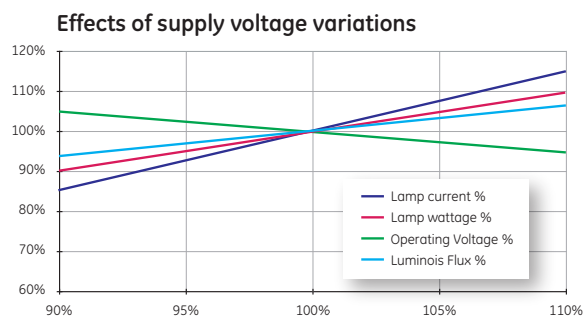
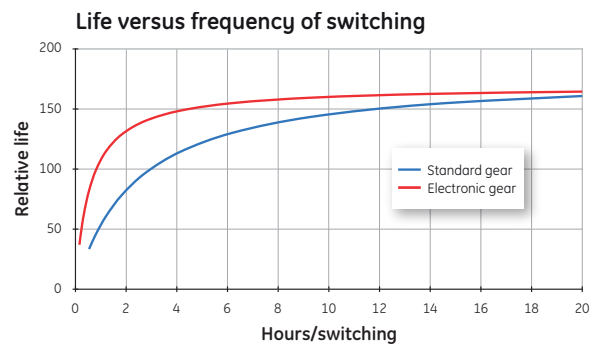
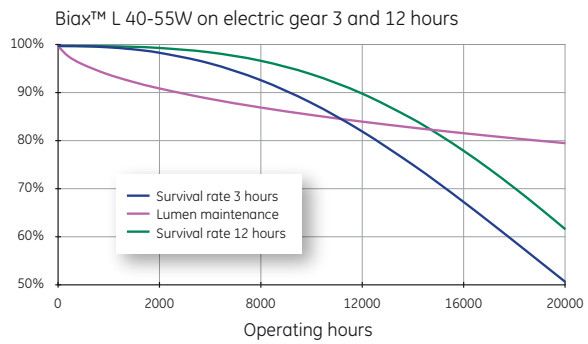
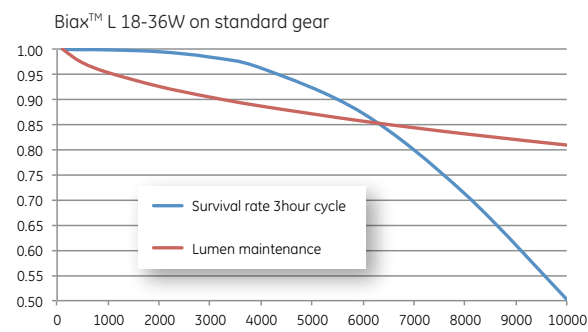
Hours	Survival rate 3h	Lumen maintenance	Survival rate 12h
100	1.00	1.00	1.00
2,000	1.00	0.94	1.00
4,000	0.99	0.91	1.00
6,000	0.96	0.89	0.99
8,000	0.93	0.87	0.97
12,000	0.83	0.84	0.90
16,000	0.68	0.82	0.78
18,000	0.60	0.81	0.71
20,000	0.51	0.80	0.62

Life versus frequency of switching

For the impact of alternative switching cycles on life refer to the graph. For applications where a fast switching cycle is required it is possible to minimize the effect of switching on lamp life with the use of suitable electronic gear. With the 12 hours switching cycle operation application life can be extended by >30%.

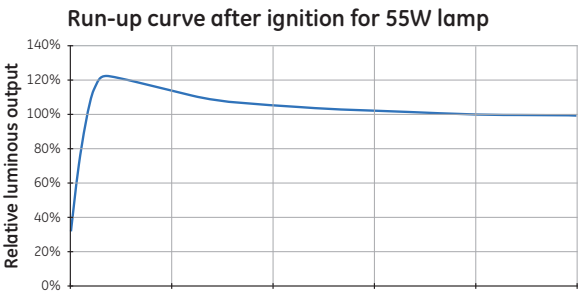
Effects of supply voltage variations on lamp performance

Biax™ L lamps will operate in a wide range of situations where voltage supplies can range from 200V to 240V, 50Hz for appropriately rated series choke ballasts. Lamp can start and operate at 10% below the rated supply voltage when the correct control gear is used. However, in order to maximise lamp survival, lumen maintenance and colour uniformity the supply voltage and ballast design voltage should be within $\pm 3\%$. Supply variations of $\pm 5\%$ are permissible for short periods only. This may be achieved by measuring mean supply voltage at the installation and selecting ballasts with appropriate settings.



Run-up curve

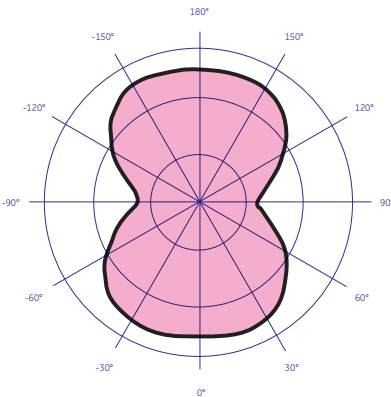
Run up curves show the relative light output as the function of time. By definition, warm-up time indicates that time when the luminous output of a lamp reaches 80% of its steady state value.



Luminous intensity distribution

The luminous intensity distribution curve shows the vertical light intensity of Biax™ L lamps.

Luminous intensity distribution



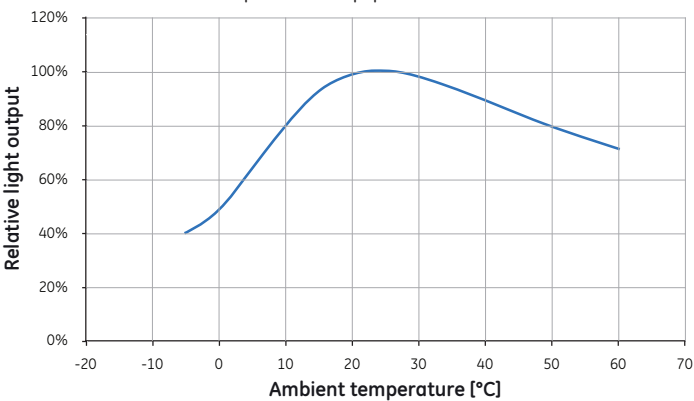
Emergency application

Biax™ L lamps may be used in suitable emergency applications. They are not recommended for use in applications where the lamp current contains a DC component due to the low mercury content of these lamps. It is essential that emergency lighting luminaires be re-lamped in accordance with the lamp information supplied with the luminaires and avoid using amalgam lamps unless they are identified as suitable on the label.

Effects of temperature changes

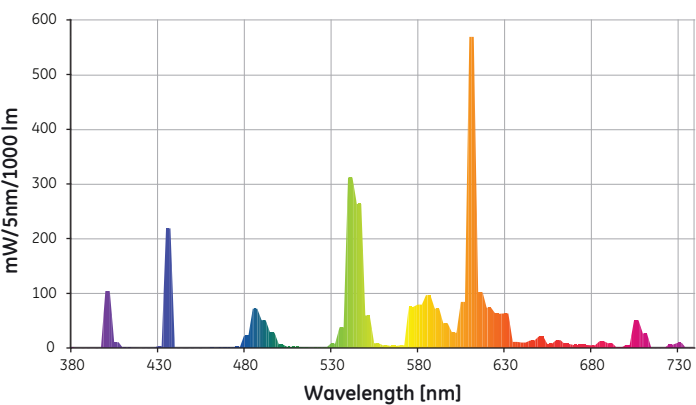
When installed in a luminaire, the temperature of the air surrounding the lamp cap changes and this can affect the light output of the lamp (cold spot is in the base). The effects of changes in ambient temperature for a typical lamp is plotted on the graph.

Light output vs. ambient temperature
55W HLBX lamps, base up position

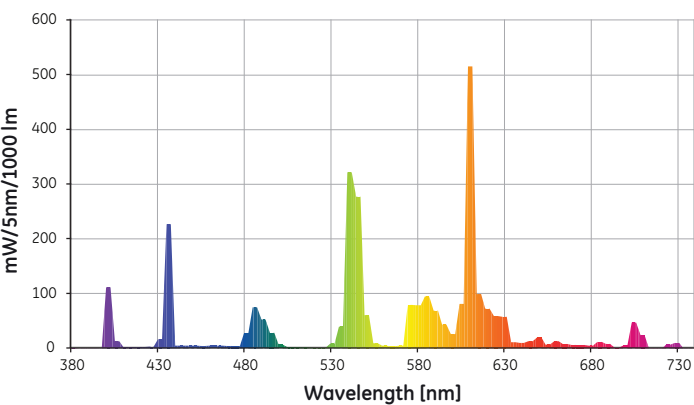


Spectral power distribution

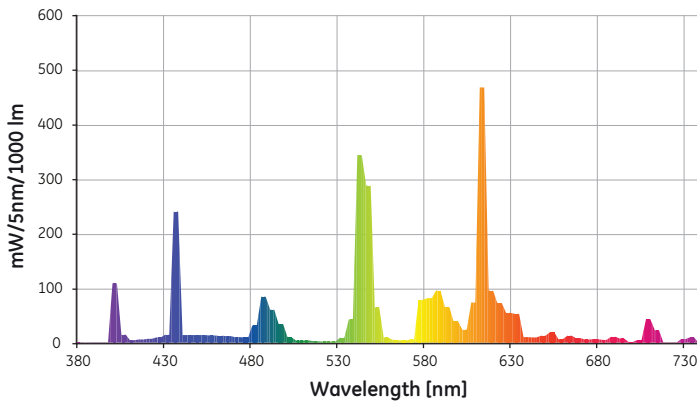
Spectral power distribution [2700K]



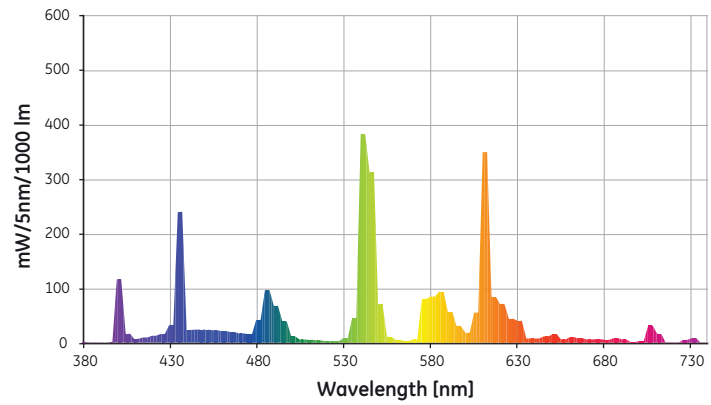
Spectral power distribution [3000K]



Spectral power distribution [3500K]



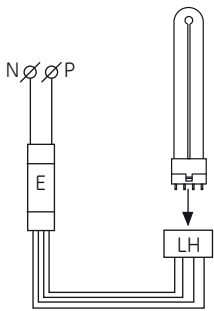
Spectral power distribution [4000K]



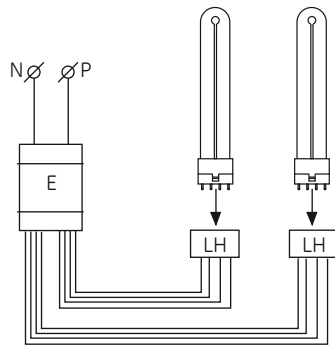
Circuit diagrams

4-pin, electronic ballast

Single lamp

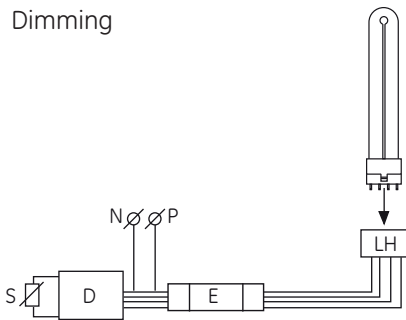


Two lamps

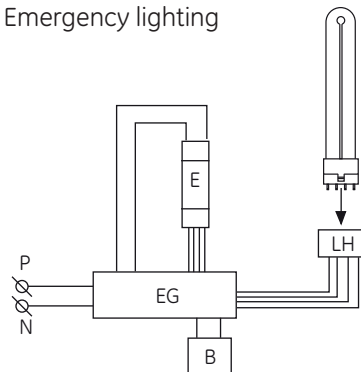


- LH: Lamp holder
- E: Electronic gear
- D: Dimmer
- S: Sensor control
- EG: Emergency gear
- B: Battery

Dimming

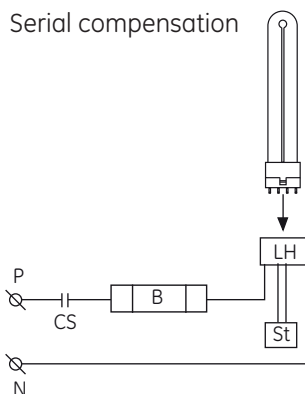


Emergency lighting

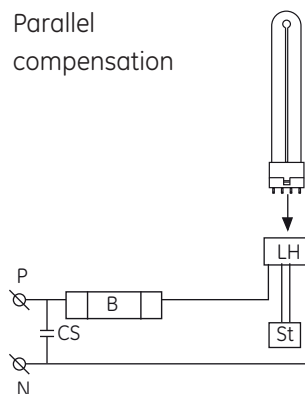


4-pin, electromagnetic ballast

Serial compensation



Parallel compensation



- LH: Lamp holder
- St: Starter
- B: Ballast 50/60Hz
- CS: Compensation capacitor

Gear specification

Cathode resistances

Nominal Power	Cap	Standard Data Sheet IEC-60901	Test current [A]	Cathode resistance at I_{test}		
				Rated [ohm]	min. [ohm]	max. [ohm]
18	2G11	-2218	0.34	12	9	15
24	2G11	-2224	0.34	12	9	15
34	2G11	N/A	0.385	11	8.2	13.8
36	2G11	-2236	0.385	11	8.2	13.8
40	2G11	-6240	0.34	12	9	15
55	2G11	-6255	0.5	8	6	10

Resistance values measured at test current
Values conform IEC 60901 related datasheets

Cathode preheat requirements

Nominal Power	Cap	Standard Data Sheet IEC-60901	$E_{min} = Q_{min} + P_{min} \cdot t_s$			$E_{max} = Q_{max} + P_{max} \cdot t_s$		
			Q_{min} [J]	P_{min} [W]	$R_{sub,min}$ [ohm]	Q_{max} [J]	P_{max} [W]	$R_{sub,max}$ [ohm]
18	2G11	-2218	1.5	0.9	8	3	1.8	11
24	2G11	-2224	1.5	0.9	8	3	1.8	11
34	2G11	N/A	1.6	1	7	3.2	2	9
36	2G11	-2236	1.6	1	7	3.2	2	9
40	2G11	-6240	1.5	0.9	8	3	1.8	11
55	2G11	-6255	2.4	1.1	5	4.8	2.2	6.5

Preheat time shall be longer than 0.4s and shorter than 3s.
Ballast preheat energy shall be measured with substitution resistance of above table. Values conform IEC 60901 related datasheets

Dimming requirements

Nominal Power	Cap	Standard Data Sheet Planned IEC-60901	I_{dmin} [A]	I_{dmax} [A]	X [A ²]	Y [A]
18	2G11	-2218	0.035	0.27	0.21	0.63
24	2G11	-2224	0.035	0.27	0.21	0.63
34	2G11	N/A	0.04	0.31	0.27	0.71
36	2G11	-2236	0.04	0.31	0.27	0.71
40	2G11	-6240	0.035	0.27	0.21	0.63
55	2G11	-6255	0.05	0.4	0.45	0.93

Minimum SoS = $I_{LH}^2 + I_{LL}^2 = X - Y \cdot I_d$
Target SoS = $I_{LH}^2 + I_{LL}^2 = X - 0.3 \cdot Y \cdot I_d$
 I_{dmax} for dimming operation = I_{dmin} for normal operation
Values conform IEC proposal

Starting requirements

Nominal Power	Cap	Standard Data Sheet IEC-60901	Ignition voltage* [V _{rms}]	Non-ignition voltage [V _{rms}]	Rsub [ohm]
18	2G11	-2218	300	150	8 ... 24
24	2G11	-2224	320	170	8 ... 24
34	2G11	N/A	570	190	7 ... 24
36	2G11	-2236	340	190	7 ... 21
40	2G11	-6240	360	220	8 ... 24
55	2G11	-6255	360	220	5 ... 15

* +10°C
Ballast open circuit voltage shall be measured with substitution resistance of above table.
Values conform IEC 60901 related datasheets.

When the new fluorescent lamp is installed into dimming system, it is advised to operate lamps for period of 100 hours at full light output.

Reference ballast characteristics

	Type [W]	Frequency [Hz]	Rated Voltage [V]	Calibration Current [A]	Ratio Volts/Amps [Ohm]	Power Factor
Standard	18	50	127	0.37	270	0.12
		60	118	0.38	240	0.075
	24	50	220	0.34	540	0.1
		60	236	0.34	605	0.075
	34	50	220	0.43	390	0.1
		60	236	0.43	439	0.075
	36	50	220	0.43	390	0.1
		60	236	0.43	439	0.075
Electronic	40	20-26 kHz	254	0.32	400	1
	55	20-26 kHz	202	0.55	185	1

Recommended list of ballasts*

	Wattage	Lamp description	Ballast manufacturer	Single ballast description	Twin ballast description
Biax™ L 4-pin	18W		Tridonic Atco	PC 1/18/24 TCL PRO	PC 2/18/24 TCL PRO
			Helvar	EL 1x36/40s-u	
			Vossloh-Schwabe	ELXc 124.418	ELXc 224.419
Biax™ L 4-pin	24W		Tridonic Atco	PC 1/18/24 TCL PRO	PC 2/18/24 TCL PRO
			Helvar	EL 1x24s	EL 2x24s
			Vossloh-Schwabe	ELXc 124.418	ELXc 224.419
Biax™ L 4-pin	36W		Tridonic Atco	PC 1/36 TCL PRO	PC 2/36 TCL PRO
			Helvar	EL 1x39/36s	EL 2x39/36s
			Vossloh-Schwabe	ELXc 136.424	ELXe 236.523
Biax™ L 4-pin	40W		Tridonic Atco	PC 1x40 TCL PRO	PC 2/40 TCL PRO
			Helvar	EL 1x36/40s-u	EL 2x36/40s
			Vossloh-Schwabe	ELXc 142.872	ELXc 240.427
Biax™ L 4-pin	55W		Tridonic Atco	PC 1/55 TCL PRO	PCA 2x55 TCL ECO
			Helvar	EL 1x55s	EL 2x55s
			Vossloh-Schwabe	ELXc 155.378	ELXc 255.429

*Ballast manufacturers have the right to change ballast specification without prior notification or official announcement so these data based on GE measurement 2010/2011.

Compliance

Standards

IEC 60061-1	Lamp caps and holders together with gauges for the control of interchangeability and safety
IEC or EN 60901	Single-capped lamps - performance requirements
IEC or EN 61199	Single-capped lamps - safety requirements
CIE S 009/E:2002	Photobiological safety of lamps and lamp systems

European Directives

CE mark	93/68/EEC; LVD: 2006/95/EC; Ecodesign 2005/32/EC, ROHS 2011/65/EU
Energy Labelling	Directive 2010/30/EU, 874/2012/EU energy labelling of electrical lamps and luminaires
RoHS	Directive 2011/65/EU on Restrictions of the use of certain Hazardous Substances (RoHS)
WEEE	Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)
REACH	Directive 2006/1907/EC on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
ErP ecodesign	Directive 2005/32/EC, 2009/245/EC ecodesign requirements (of Energy-related Products) for tertiary sector lamps

