

# Constant Voltage LED Drivers

320W for Outdoor



DATA SHEET



## Product information

TungSRAM's new Constant Voltage LED Drivers are designed for lighting used for signage and landscape illumination. The drivers have built-in active PFC, multiple protections, and 10KV surge immunity, with 12V, 24V, 36V, 48V output voltage. The range has a robust design with high reliability and long lifetime.

## Product Features

- Constant voltage output for 12V/24V, with Programmable Constant Current for 36V/48V
- High power factor >0.96 (230VAC & full load)
- Universal input voltage 90~305VAC
- Protections: Short circuit, Over Temperature, Over Voltage, Over Current
- Surge immunity: line-line 5KV, line-earth 10KV
- IP67, fully potted with silicon glue, suitable for wet/damp & dry locations;
- Ambient temperature: -40°C - 60°C

## Application area

- Suitable for landscape lighting

## Specification summary

Max Output Power(W)	Output Voltage Range (Vdc)	Output Current Range (A)	Typical Efficiency	Model	Product Code
320	12	0~22.00	91%	LPS Sign 320/12 90-305V 67/B	93110180
	24	0~13.33	92%	LPS Sign 320/24 90-305V 67/B	93110177
	36	0~8.90	92%	LPS Sign 320/36 90-305V 67/B	93110181
	48	0~6.67	92%	LPS Sign 320/48 90-305V 67/B	93110178

All performance parameters are measured at 25°C ambient temperature, 230VAC input, full load conditions, except for those specified

## INPUT SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90VAC	100-277VAC	305VAC	
Input Frequency	47HZ	50/60	63Hz	
Leakage Current	-	-	0.75mA	277VAC/50Hz
Input AC Current	-	-	4.0A	100-277AC & full load
Power Factor	0.95	0.96	-	230VAC, 100% load
Total Harmonic Distortion	-	15%	20%	230VAC, 100% load

## OUTPUT SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%	-	5%	Full load
Output Voltage Ripple Max (pk-pk, full load)	-	-	6%	Full load with additional parallel 0.1uF ceramic and 10uF electrolytic capacitor. Measured by 20MHz bandwidth oscilloscope.
Output overshoot	-	-	10%	When the power is on
Line Regulation	-	-	3%	25°C ±10°C ambient temperature, 100% load, change input from 90VAC to 305VAC.
Load Regulation	-	-	3%	25°C ±10°C ambient temperature, 230VAC input voltage, change load from 50% to 100%
Turn-on Delay Time	-	-	3S	230VAC, 100% load

## GENERAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Notes
Efficiency 230VAC Vo=12V Vo=24V Vo=36V Vo=48V	<b>320W</b> 89% 90% 90% 92%	<b>320W</b> 91% 92% 91% 94%		Measured at full load and 25C ambient temperature
Dielectric Strength	Input-Output	-	3750VAC	10mA/60S
	Input-PE	-	1650VAC	
	Output- PE	-	1600VAC	
Grounding Resistance	-	-	0.1Ω	25A/60S
Insulation Resistance	50MΩ	-	-	Input-Output, Input-PE, Output-PE, 500Vdc, 60S, 25°C, 70%RH
MTBF	-	200000 Hours	-	2230VAC, 80% load (MIL-HDBK-217F)
Lifetime	-	50000 Hours	-	230VAC & 100% load, 70°C Case temperature, see to Lifetime vs Tc curve
Tc_S - Operating Case Temperature for Safety	-40C	-	+85C	
Tc_W - Operating Case Temperature for Warranty	-40C	-	+50C	
Storage Temperature	-40C	-	+85C	20%-95% RH, non-condensing

## RECOMMENDED NUMBER OF DRIVERS PER MCB TYPE

Driver	Inrush Current (A) Measured at 230VAC	Inrush Current (A) Claimed Max at 230VAC	Inrush Current (A) 50% peak pulse duration (µs)	Input Current (A) at 230V	Proof factor (k)	Recommended number of Drivers per MCB					
						Type B 10A	Type B 16A	Type B 25A	Type C 10A	Type C 16A	Type C 25A
320W	42.8	50	88	4.0	15	7	11	17	11	18	28

Recommended number of Drivers per MCB =  $(I_{hold}/I_{inrush}) \times 25\%$  de-rating, where  $I_{hold}$  = Proof factor (k) x non-tripping current. 25% de-rating accounts for unknown variables of installation wiring, load, thermal conditions, etc.

Recommendations are a guide only and based on standard twin+earth installation cable at 1.5mm<sup>2</sup>. Consideration has been made to ensure these data are conservative and safe, since other external factors may affect the number of drivers that can be connected to a circuit breaker and these factors are beyond the control of Tungfram. We accept no responsibility for consequential damages or losses resulting from using these guidelines.

## FEATURES

Parameter	Notes
Short Circuit Protection	Input Current is decreased if short-circuit on output side. Automatic recovery when fault condition is removed
Over Current Protection	Driver into Protection status at > 1.1-1.5x Max Load Current. Automatic recovery when fault condition is removed
Over Voltage Protection	Driver into protection status at > 1.1-1.3x Rated Load Voltage. Automatic recovery when fault condition is removed
Over Temperature Protection	Shut-down into protection status when Tc > 90C. Automatic recovery when fault condition is removed
Hot Wire	Yes
Insulation Class	Class I

## SAFETY STANDARDS

Safety Category	Country / Territory	Standards
CE	Europe	EN61347-1, EN61347-2-13
CB	CB Countries	IEC61347-1, IEC61347-2-13

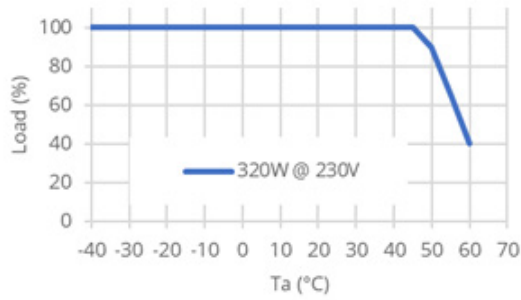
## EMC COMPLIANCE

Safety Category	Country / Territory	Standards
CE	Europe	EN 55015, EN 61000-3-2, EN 61000-3-3
		EN61000-4-2,3,4,5,6,8,11 EN61547

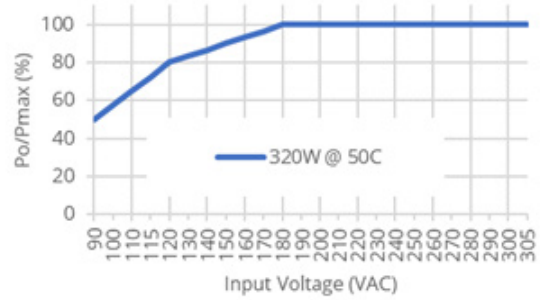
This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

# Charts

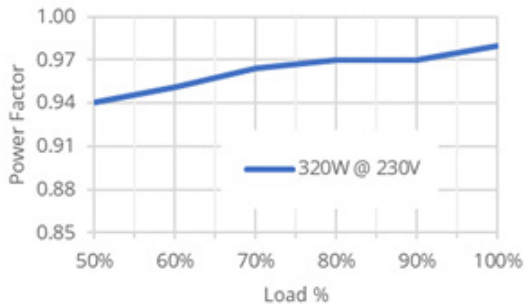
Load vs Ambient Temperature



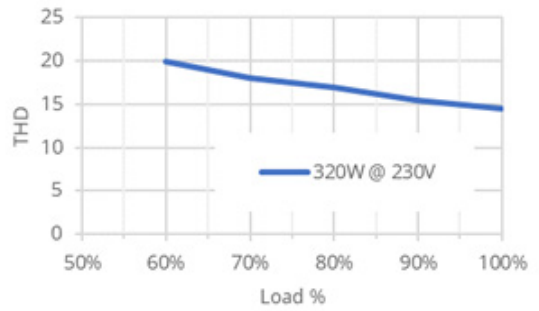
Output Power vs Input Voltage



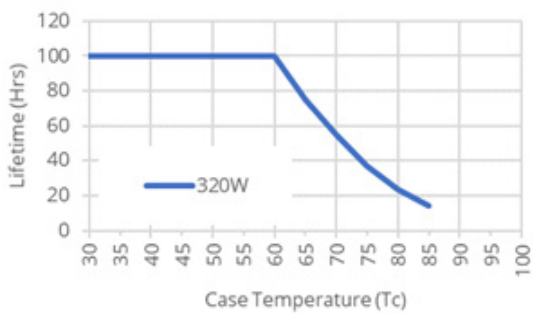
Power Factor vs Load



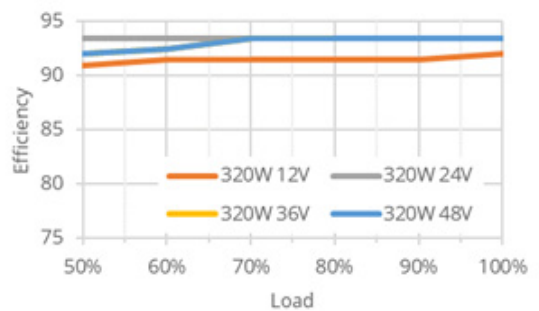
Total Harmonic Distortion vs Load



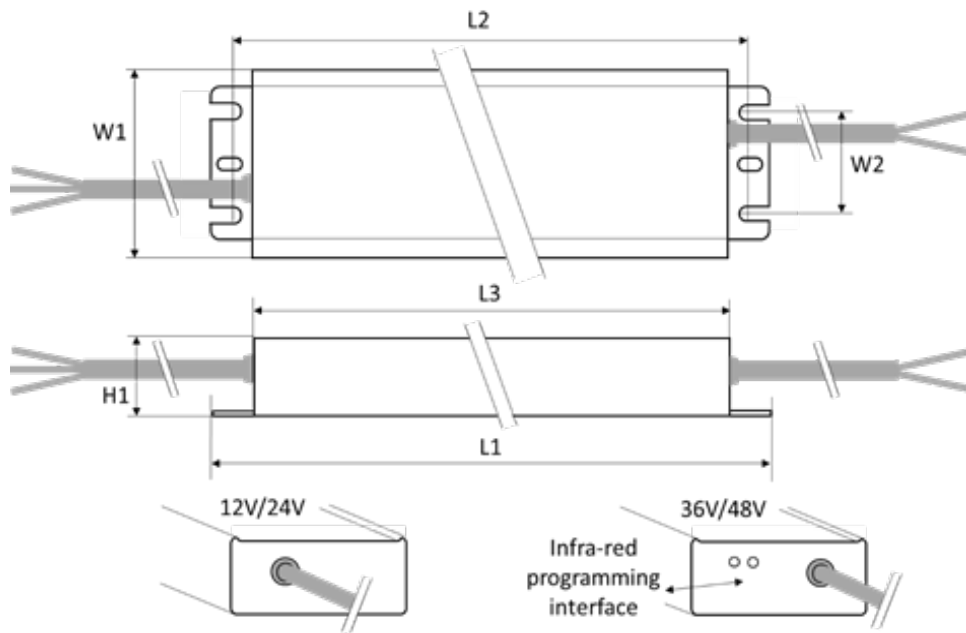
Lifetime vs Case Temperature



Efficiency vs Load



# DIMENSIONS



Parameter	Unit	320W 12/24V	320W 36/48V
Total Length - L1	mm	234	234
Total Width - W1	mm	98	98
Total Height - H1	mm	40	40
Screw-hole Min Length - L2	mm	219	219
Screw-hole Max Length - L2	mm	226	226
Screw-hole Width - W2	mm	40	40
Housing length - L3	mm	210	210
AC Input wire gauge	mm <sup>2</sup>	3x 1	3x 1
AC Input wire length	mm	300	300
DC Output wire gauge	mm <sup>2</sup>	2x 2.5	2x 1.5
DC Output wire length	mm	300	300
Default wire strip length	mm	50 +/-3	50 +/-3
Default bare wire length	mm	5 +/-1	5 +/-1
Net weight	grams	1750+/-50	1750+/-50
Shipping Carton quantity	units	10	10
Shipping Carton L*W*H	mm	610*370*160	610*370*160