



# 660 Series

## Fluorescent Lamp Driver Unit (115V AC/110V DC/52V DC)



Long Life Reliability  
does not cost the earth

LPA-EXCIL ELECTRONICS


### Feature Summary

- Galvanic isolation between system inputs and outputs — rated up to 1.5kV.
- Advanced Electronic Lamp Drive incorporates True Soft-Start technology to prolong lamp life.
- High reliability design. All variants >150,000 hours MTBF (29 years)\*
- Automatic shutdown and restart to give enhanced passenger comfort.
- LUL creepage and clearance compliant connectors.



### Product Codes

- Due to the wide range† of options available, individual products in the 660 series range are referred to by product code below.

660 Product Range Standard Features	
<b>Number of Lamps Driven</b>	1
<b>Enclosure Type</b>	Standard LUL Enclosure (Figure 1)
<b>Input/Output Connectors</b>	LUL-Compliant High Creepage and Clearance Faston Connectors 

Lamp Type	-52VDC	110VDC	115VAC	Lamp Type	-52VDC	110VDC	115VAC
58W T8	660108		660109	14W T5		660159	
40W T12	660143		660141	15W T8	660165		
36W T8	660128	660197	660604	18W T8	660129	660600	
28W 2D	660142		660608				
35W T5		660157					
28W T5		660188					
21W T5		660158					
18W PLL		660190					

\* MTBF calculated using US MIL-217F GM standard.

† Our most popular 660 series products have been listed in the table below. Other variants are available on request, contact us for more details.

## Input Specification

### Input Voltage and Current Data

Nominal Device Supply Voltage	52V DC	110V DC	115V AC
Input Supply Voltage Range	32-63V DC	67-140V DC	80-140V AC RMS (@850Hz)
Input voltage limit without damage	74V DC	154V DC	161V AC RMS (@850Hz)

	52V DC Products						mA DC
	T12	T8				2D	
	40W	58W	36W	18W	15W	28W	
DC Input Current (Single Lamp)* (@ 52V DC)	810	1150	730	450	350	590	mA DC
Quiescent Current (No Lamp)* (@ 52V DC)	32						

	110V DC Products					mA DC
	T5				PLL	
	35W	28W	21W	14W	18W	
DC Input Current (Single Lamp)* (@ 110V DC)	380	315	230	170	204	mA DC
Quiescent Current (No Lamp)* (@ 110V DC)	15					

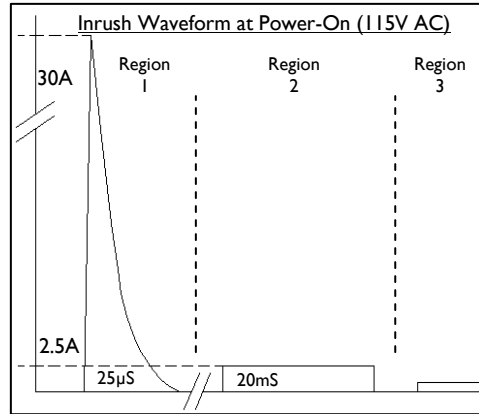
	115V AC Products				mA AC
	T12	T8		2D	
	40W	58W	36W	28W	
AC Input Current (Single Lamp)* (@ 115V AC)	369	520	335	268	mA AC
Quiescent Current (No Lamp)* (@ 115V AC)	32				

### Power On Inrush Data

	52V DC	110V DC	115V AC	
Peak Inrush Current	30 (@ 63V DC)	65 (@ 140V DC)	30 (@ 140V AC)	A
Time to Half Value	20 (@ T=25°C)	70 (@ T=25°C)	20 (@ T=25°C)	µs

Section continued overleaf ↗

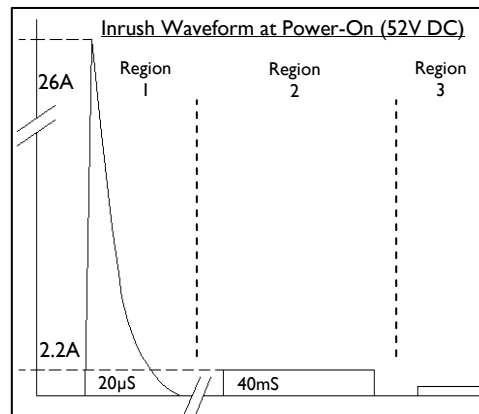
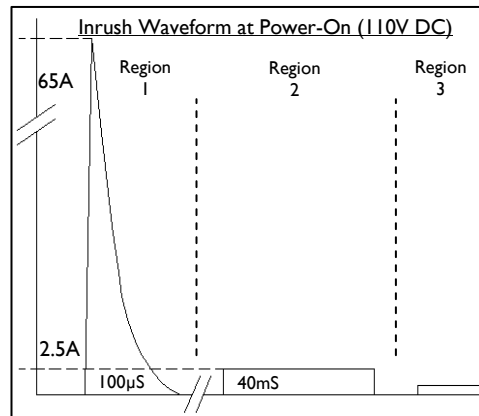
\* Input current values across the entire operational voltage range are available on request



**Region 1:** All variants incorporate an inductor to limit the peak value of the input capacitor charging current.

**Region 2:** The input supply voltage is boosted to a regulated value via a current controlled process. During this process the input current is limited to 2.5A.

**Region 3:** The input current drops to quiescent levels until the lamp drive is activated and steady state current consumption results.



## Output Specification<sup>†</sup>

	All variants	
<b>Arc Current Crest Factor<sup>†</sup></b>	< 1.5, all variants	
<b>Minimum Must Strike Temp.</b>	-30*	°C
<b>Lamp Strike</b>	Whole range >300,000 strikes, in accordance with UIC555-1 2.13/3.5	
<b>Switch Cycles</b>		

\* The 660 Series FLDU will strike the lamp without the requirement for a 'Striking Aid' within the above temperature limit.

† Further details of lamp drive output parameters are available on request.



## Environmental Specification

		All Variants			
<b>Unit Weight</b>		525	<b>g</b>		
<b>Dry Heat (Steady State)</b>	<b>RIA13 1990</b>	70	<b>°C</b>		
		6	<b>Hrs</b>		
<b>Sealing</b>		IP65			
<b>Shock and Vibration</b>		EN50155 & EN61373			
<b>Operating Temperature Range</b>		-30 to +70 (110V DC)	<b>°C</b>		
		-30 to +55 (Other Variants)			
<b>MTBF - Ground Mobile @ 40°C (16 hours/day)</b>		168,000 (115V AC)	<b>Hrs</b>		
		201,000 (110 V DC)			
		175,000 (52V DC)			
				29 (115 V AC)	<b>Yrs</b>
				34 (110V DC)	
				30 (52V DC)	

## Compliance

The 660 Series FLDUs comply with the following standards:

- EN50121-3-2
- RIA12 (applies to -52VDC / 115VAC FLDUs Only)
- EN61373
- EN50155
- EN60529 to IP65
- 110VDC FLDUs comply with the following:

## Safety Specification

All 660 Series variants come equipped with the following protection circuitry as standard:

- Input voltage reverse protection (non-destructive).
- Lamp misconnection and failure protection.
- No lamp, no strike feature.
- Under voltage cut-off.
- Auto lamp restart (when a lamp is connected)

\* All EMC immunity tests for the 660 product range comply with performance criteria 'A'



## Installation Guide

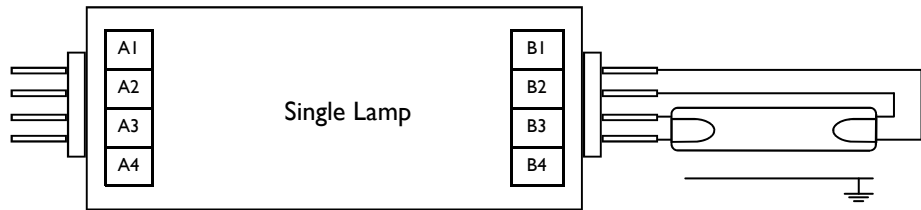
Maximum Supply Cable Impedance		
No. FLDU's	Input Voltage V DC	Impedance $\Omega^{\dagger}$
1	67-80	1
1	80-90	2
1	90-140	4

Recommended Cable Size	
On input side (Supply/Control Signal)	1.0-2.5mm <sup>2</sup>
On lamp side	0.5-1.0mm <sup>2</sup>

Maximum Cable Capacitance for Optimum Performance and EMC Suppression		
Max	15pF	between two sets of lamp wires
Max	75pF	between one set of lamp wires and earth

Maximum Output Cable Length	2m
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### Installation Diagram - Faston Connector Devices



Input Connector Pin-Out			
Pin ID	52V DC Variant	110V DC Variant	115V AC Variant
A1	Not Connected	Not Connected	115V AC
A2	52V DC -ve	110V DC +ve	Not Connected
A3	52V DC +ve	110V DC -ve	Not Connected
A4	Not Connected	Not Connected	115V AC

To achieve optimum performance the following output cables must be kept as short as possible:

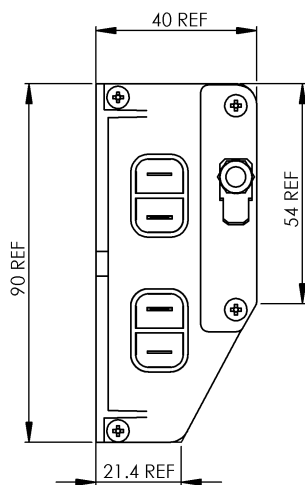
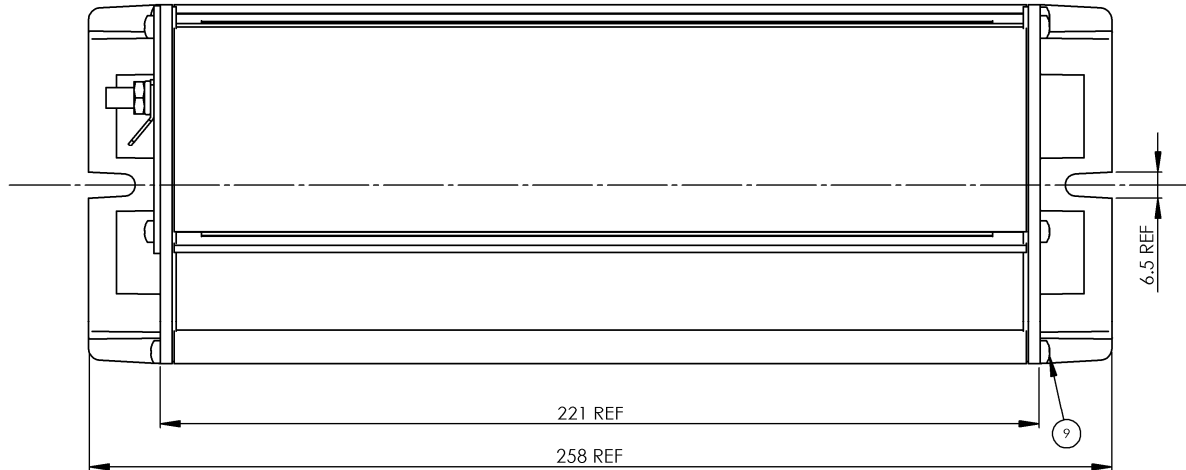
Faston Blades	Single Lamp	B3 & B4
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<sup>†</sup> Source impedance value MUST be divided by the number of FLDUs on each supply cable

## Mechanical Specification

All Dimensions in mm unless stated otherwise

Figure 1 - Aluminium LUL Enclosure  
0.25" LUL-compliant<sup>†</sup> Faston connector<sup>‡</sup>



† Blade Connector meets LUL standards for creepage and clearance.

‡ Polarisng keys available by special request. Contact us for more details.

LPA-Excil makes every effort to ensure the accuracy of the information contained within this datasheet. However we reserve the right to withdraw and re-issue this datasheet at a later date.



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