Harvard
ENGINEERING PLC
ELECTRONICS ENGINEERS & MANUFACTURERS

1-10V Dimmable - High Power, CoolLED DRIVERS 350mA to 1400mA

***Cool-LED* DRIVERS provide a performance solution for powering high-brightness LEDs**

Analogue Dimming Control
Linear dimming from conventional 1-10V dimmer. Can also be programmed with a fixed or variable resistor

Regulated Output Current
LED series string is supplied with electronically regulated constant current

High Efficiency and Long Life
High efficiency design ensures cool operation and long life

Active Power Factor Correction
Reduces mains current and lowers electricity cost

Self Protected
Open and short-circuit protected, self-resetting over temperature trip

Compact Enclosure and Fast Assembly
Versions available: Flying Lead 'A' type, Integral 'B' type, Remote Mount 'C' type.
'C' type features screwless cable clamps.
Potted option available on 'A' type

Pending Pending

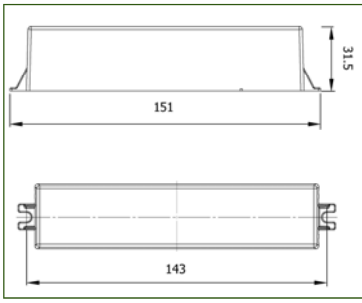
- Fully-isolated, SELV output delivering up to 33W of power
- High power factor (0.98)
- Powers High Brightness LED strings or LED Arrays / LED Modules
- Constant current output
- Self resetting thermal trip
- Double insulated (Class II)
- 86% efficiency
- Screwless cable clamps for fast assembly ('C' type only)
- Surge protection up to 4kV
- Linear dimming from 5% to 100%
- Integral and remote versions
- Made in UK
- Available currents 350mA, 500mA, 700mA, 1000mA, 1200mA*, 1400mA*. (See reverse for 1000mA to 1400mA spec)

*Current 1200/1400mA versions produced to power Bridgelux BXRA-N1200 module. Consult sales for alternative requirements.

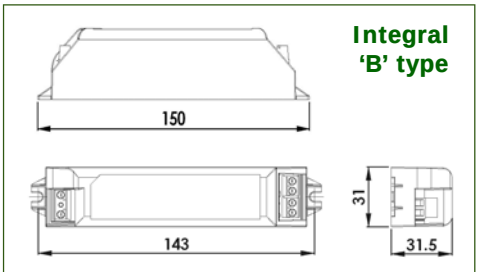
Technical Specification 350 to 700mA

Parameter \ Model	CL350A-240-A, B or C	CL500A-240-A, B or C	CL700A-240-A, B or C
Mains input voltage range	198 to 265V ac rms		
Mains frequency	47 to 63Hz		
Power factor at full load	>0.95 (0.98 typical)		
Efficiency at full load	86% typical		
Mains surge protection	4kV common-mode 2kV differential		
Input-output isolation	3.75kV ac rms		
Ambient temperature range	-40°C to 50°C		
Maximum Tc temperature	80°C		
Humidity	95% max non-condensing		
Thermal trip	internal self-resetting		
Output current (undimmed)	350mA	500mA	700mA
Dimming range (output current)	5%-100%		
Min to max output power	0.4W (dimmed) to 33W		
LED string voltage (At maximum LED current)	10.8V to 48V at full current. 8V minimum (fully dimmed)		
Typical no.of LEDs (1-3watt rated)	3 to 14 in series (Depending on LED forward voltage and rated power)		
Open-circuit output voltage	<50V (<36V CL1000A)		
Enclosure	White polycarbonate UL94-V0 rated		
Dimensions	See diagrams for A, B and C types		
Terminal blocks ('B'+'C' versions)	Rising clamp 5mm pitch		
Wire size ('B' and 'C' versions)	0.5mm² to 1.5mm²		
Weight	125g (260g typical for potted 'A' version)		
Compliant standards	EN 61347-2-13, EN 61000-3-2, EN 61000-3-3, EN62384, EN 60929, EN 61547, EN55015		

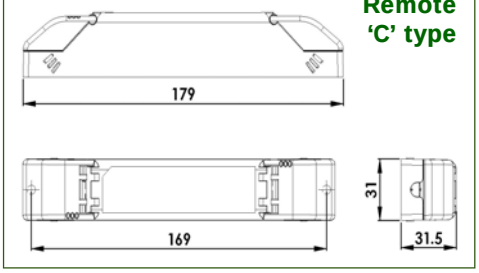
'A' type Flying Leads



Integral 'B' type



Remote 'C' type



Harvard Engineering Plc, Harvard House, Westland Road, Leeds. LS11 5XA
Tel: +44(0)113 383 1000 www.harvardeng.com email: sales@harvardeng.com

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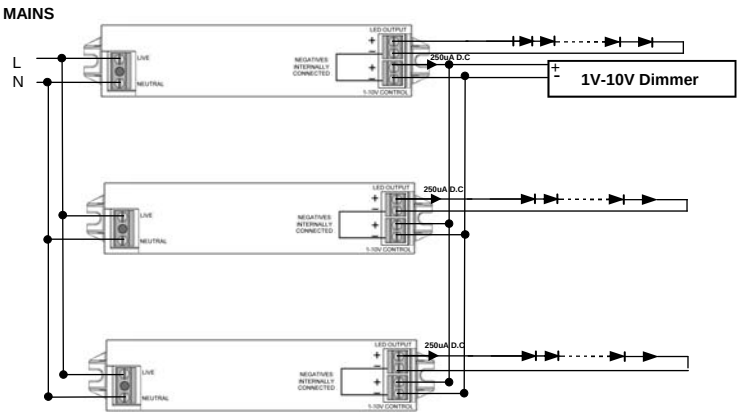
ELECTRONIC DIMMER CONNECTION
The electronic dimmer must be capable of 'sinking' the total current from all drivers. For example, a dimmer with 30mA sink capability will control 100 drivers.

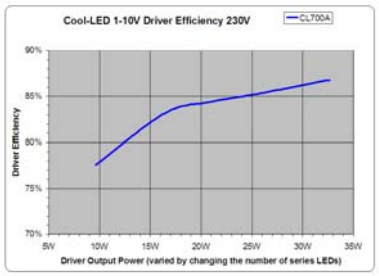
IMPORTANT.
Disconnect the mains supply for at least one minute before connecting or disconnecting the LED string.

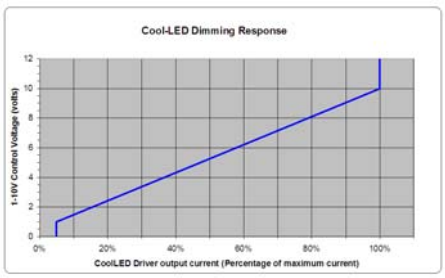
1-10V DIMMING CONTROL OUTPUT
A voltage between 0V and 1V on this terminal gives minimum light output (5% of maximum).
A voltage of 10V (or open circuit connection) gives maximum light output.
Between 1V and 10V terminal voltage, the light output is infinitely variable.

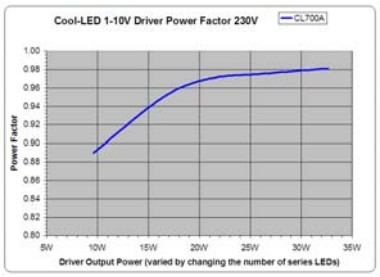
The negative terminal of the 1-10V is internally connected to the LED negative connection. This means that the insulation class of the external 1-10V controller may affect the ground isolation and SELV rating of the LED output.

The 1-10V dimming method is described in EN 60929.









Technical Specification 1000 to 1400mA

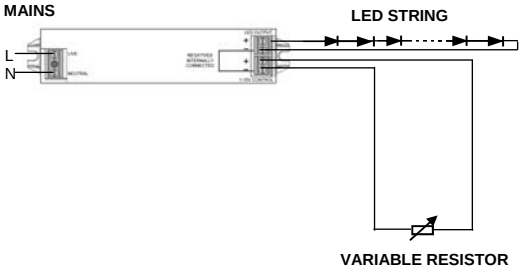
Parameter \ Model	CL1000A-240-A, B or C	CL1200A-240-A, B or C	CL1400A-240-A, B or C
Mains input voltage range	198 to 265V ac rms		
Mains frequency	47 to 63Hz		
Power factor at full load	>0.94 (0.96 typical)		
Efficiency at full load	86% typical	84% typical	83% typical
Mains surge protection	4kV common-mode 2kV differential		
Input-output isolation	3.75kV ac rms		
Ambient temperature range	-40°C to 50°C		
Maximum Tc temperature	80°C		
Humidity	95% max non-condensing		
Thermal trip	internal self-resetting		
Output current (undimmed)	1000mA	1200mA	1400mA
Dimming range (output current)	5%-100%		
Min to max output power	0.4W (dimmed) to 33W	0.5W (dimmed) to 28W	0.6W (dimmed) to 26W
LED string voltage (At maximum LED current)	10.8V to 33V. 8V minimum (fully dimmed)	10.8V to 23.5V. 8.5V minimum (fully dimmed)	10.8V to 18.5V. 8.5V minimum (fully dimmed)
Typical no.of LEDs (1-3watt rated) (Depending on LED forward voltage and rated power)	3 to 9 in series	3 to 7 in series	3 to 6 in series
Open-circuit output voltage	36V	>25V	>20V
Enclosure	White polycarbonate UL94-V0 rated		
Dimensions	See diagrams for A, B and C types		
Terminal blocks ('B'+'C' versions)	Rising clamp 5mm pitch		
Wire size ('B' and 'C' versions)	0.5mm² to 1.5mm²		
Weight	125g (260g typical for potted 'A' version)		
Compliant standards	EN 61347-2-13, EN 61000-3-2, EN 61000-3-3, EN62384, EN 60929, EN 61547, EN55015		

RESISTIVE PROGRAMMING

Variable or fixed resistor

Example:
1 unit = 50k variable resistor
10 units = 5k variable resistor

For control of multiple units connect all the 1-10V interfaces in parallel, observing



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