LL1x10-42-E-CC

42 W **Constant Current** LED driver

Product code: 5527

42 W 220 – 240 V 0 / 50 – 60 Hz

- Very high efficiency up to 94%
- Low current ripple, complying with IEEE 1789 recommendation
- Long lifetime up to 100 000 h
- Suitable for DC use
- Driver protection Class I
- Ideal solution for Class I luminaires, suitable for Class II luminaires too*

Illustrative only, the driver mechanics have been updated from this photo, see connections and dimensions pictures in this datasheet for the latest information..

* See page 4 for details.

Functional Description

- Adjustable constant current output: 120 mA (default) to 350mA
- 140 mA fixed current output option
- Current setting with external resistors
- Open & short circuit protection

Mains Characteristics

Voltage range	198 VAC – 264 VAC
	Withstands max. 320 VAC (max. 1 hour)
DC range	176 VDC – 280 VDC
starting voltage	> 190 VDC
Mains current at full load	0.18 – 0.23 A
Frequency	0 / 50 Hz – 60 Hz
THD at full power	< 7 %
Leakage current to earth	< 0.3 mA
Tested surge protection	1 kV L-N, 2 kV L-GND (IEC 61000-4-5)
Tested fast transient protection	2 kV (IEC 61000-4-4)

Insulation between circuits & driver case

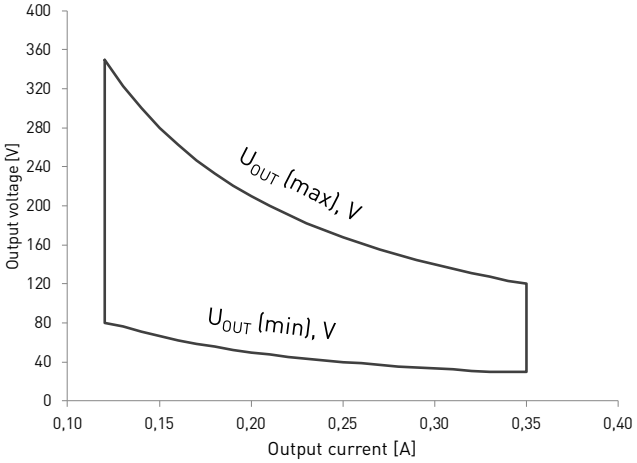
Mains circuit - Output	Non-isolated
Mains and output - Driver case	Basic insulation

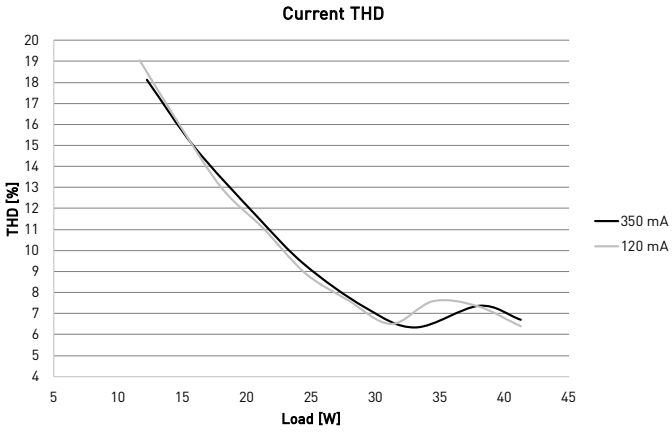
Load Output (non-isolated)

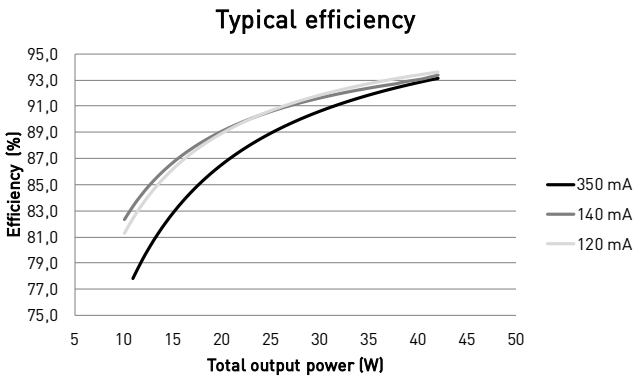
Output current (I_{out})	120 mA (default) – 350 mA
Accuracy	± 5 %
Ripple	< 2 %* at ⩽ 120 Hz
	*) Low frequency, LED load: Cree MX3 LEDs
PstLM	< 0.02*
SVM	< 0.02*
	*) At full power, measured with Cree XP-G LED modules.
U_{OUT} (max) (abnormal)	400 V

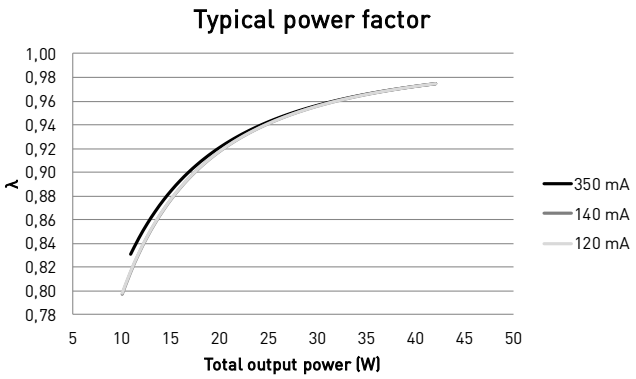
I_{OUT}	120 mA	140 mA	350 mA
$P_{OUT(MAX)}$	42 W	42 W	42 W
U_{OUT}	80 – 350 V	80 – 300 V	30 – 120 V
PF (λ) at full load	0.98	0.98	0.98
Efficiency (η) at full load	94 %	94 %	93 %

Operating window and driver performance









Operating Conditions and Characteristics

Highest allowed t_c point temperature	75 °C
Ambient temperature range*	–25 °C … +50 °C*
in independent use	–25 °C … +40 °C
Storage temperature range	–40 °C … +80 °C
Maximum relative humidity	No condensation
Mains switching cycles	> 100 000 cycles
Lifetime (90 % survival rate)	100 000 h, at t_c = 65 °C
	90 000 h, at t_c = 70 °C
	60 000 h at t_c = 75 °C

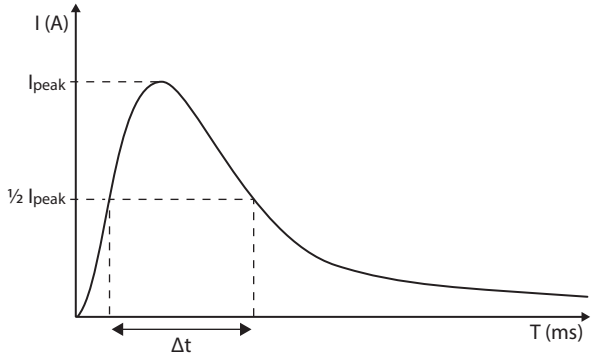
**) For other than independent use, higher t_a of the control gear possible as long as highest allowed t_c point temperature is not exceeded*

Quantity of drivers per miniature circuit breaker 16 A Type C

Based on I_{cont}	Based on inrush current I_{peak}	Typ. peak inrush current I_{peak}	1/2 value time, Δt	Calculated energy, $I_{peak}{}^2\Delta t$
57 pcs.	62 pcs.	23 A	176 µs	0.0672 A^2s

CONVERSION TABLE FOR OTHER TYPES OF MINIATURE CIRCUIT BREAKER

MCB type	Relative quantity of LED drivers
B 10 A	37 %
B 16 A	60 %
B 20 A	75 %
C 10 A	62 %
C 16 A	100 % (see table above)
C 20 A	125 %

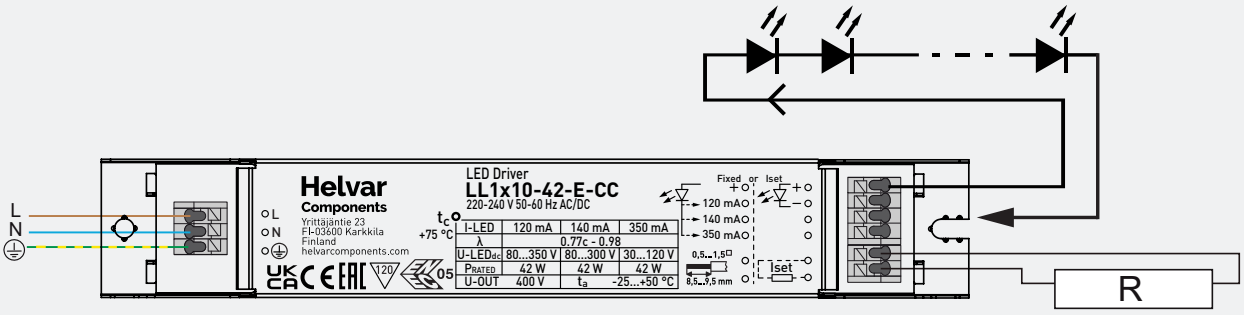


Type C MCB's are strongly recommended to use with LED lighting. Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

Connections and Mechanical Data

Wire size	0.5 mm² – 1.5 mm²
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	5 m
Weight	135 g
IP rating	IP20

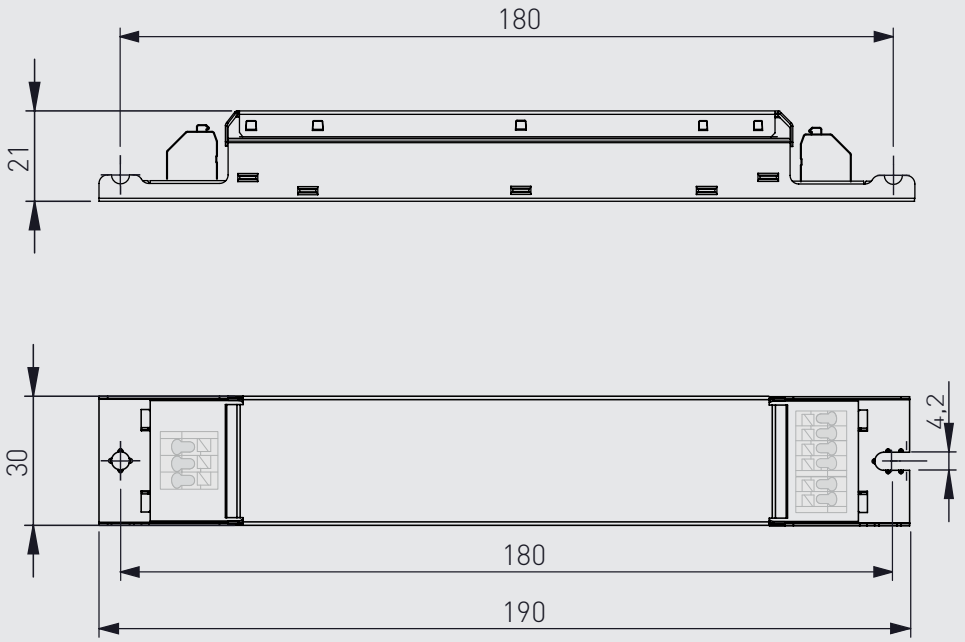
Connections



Note:

- *Not suitable for load side switching operation*
- *Connect load between terminal (+) and (120mA / Iset) for resistor adjusted output currents.*

Dimensions (mm)



Output current can be set with the current setting resistor connected to the Rset terminal. Example current and resistor values across the range can be found in the following table. More information about the current setting resistor is given on page 4.

Iset current setting resistor values

R(Ω)	0	47	120	180	270	330	470	560	680	820	1k	1,2k	1,5k	1,8k	2,2k	2,74k	3,3k	3,9k	4,7k	5,6k	8,2k	12k	22k	∞
I_{out} (mA)	350	340	330	320	310	300	290	280	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120
Order Code	T70000	T70470	N/A	N/A	T70271	T70331	T70471	N/A	T70681	T70821	T70102	N/A	T70152	N/A	T70222	T72741	T70332	T70392	T70472	T70562	T70822	T70123	N/A	N/A

LL1x10-42-E-CC LED driver is suited for built-in usage in luminaires. With LL1x2130-SR strain reliefs, independent use is possible too (see the LL1x2130-SR datasheet for details). In order to have safe and reliable LED driver operation, the LED luminaires will need to comply with the relevant standards and regulations (e.g. IEC/EN 60598-1). The LED luminaire shall be designed to adequately protect the LED driver from dust, moisture and pollution. The luminaire manufacturer is responsible for the correct choice and installation of the LED drivers according to the application and product datasheets. Operating conditions of the LED drivers may never exceed the specifications as per the product datasheet.

Installation & operation

Maximum ambient and t_c temperature:

- For built-in components inside luminaires, the t_a ambient temperature range is a guideline given for the optimum operating environment. However, integrator must always ensure proper thermal management (i.e. mounting base of the driver, air flow etc.) so that the t_c point temperature does not exceed the t_c maximum limit in any circumstance.
- Reliable operation and lifetime is only guaranteed if the maximum t_c point temperature is not exceeded under the conditions of use.

Current setting resistor

LL1x10-42-E-CC LED driver features a constant current output adjustable via current setting resistor.

- An external resistor can be inserted in to the current setting terminal, allowing the user to adjust the LED driver output current.
- When no external resistor is connected, then the LED drivers will operate at their default lowest current level.
- A standard through-hole resistor can be used for the current setting. To achieve the most accurate output current it is recommended to select a quality low tolerance resistor. Minimum diameter for resistor leg is 0.51mm.
- Always connect the current setting resistor only into the terminals marked with Rset on the LED driver label.
- For the resistor/current value selection, refer to the table on page 3.
- For drivers not providing isolation (non-isolated), current setting resistor must be insulated according safety regulations.

LED driver earthing

- LL1x10-42-E-CC LED driver is a protective Class I device and designed for Class I luminaires.
- If used inside **Class I** luminaires, this LED driver must always have the protective earth cable connected for safety reasons.
- If used inside **Class II** luminaires, the safety of the luminaire shall be ensured through double/reinforced insulation of live parts. This LED driver is only basic insulated, and provided that luminaire insulation is done according to the latest standards (e.g. IEC/EN 60598-1), to fulfill the requirements of the standard the earth terminal of the driver **must be left unconnected.** No protective earth symbols shall be visible in the luminaire connector block or elsewhere in the luminaire. However, the EMC performance of Class I LED drivers change when left unearthed, so it is always the responsibility of the integrator to take measures to ensure that the assembled luminaire complies with latest EMC standards.

Miniature Circuit Breakers (MCB)

- Type-C MCB's with trip characteristics in according to EN 60898 are recommended.
- Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

Installation site

- The general preferred installation position of LED drivers for independent use is to have the top cover facing upwards.

Lamp failure functionality

No load

When open load is detected, driver limits output voltage according to Uout (max) (abnormal).

Overload

Driver can withstand overload, however reliable operation is only guaranteed in specified voltage range.

Underload

Reliable operation of the driver is only guaranteed in specified voltage range.

Short circuit

Driver can withstand output short circuit.

Conformity & standards

General and safety requirements	EN 61347-1
Particular safety requirements for DC or AC supplied electronic control gear for LED modules	EN 61347-2-13
Thermal protection class	EN 61347, C5e
Mains current harmonics	EN 61000-3-2
Limits for voltage fluctuations and flicker	EN 61000-3-3
Radio frequency interference	EN 55015
Immunity standard	EN 61547
Performance requirements	EN 62384
Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers	IEEE 1789-2015
Compliant with relevant EU directives	
RoHS/REACH compliant	
ENEC and CE / UKCA marked	

Label symbols

Thermally controlled control gear, incorporating means of protection against overheating to prevent the case temperature under any conditions of use from exceeding 120 °C.