TR30-DA-350-700-W/B/G

Helvar Components

30 W **Dimmable DALI-2** mains track adapter for LEDs

Product code: 5946
(see last page)

30 W 220-240 V 0 / 50 – 60 Hz

- In-track adapter with integrated LED driver for luminaires designed for mains voltage track systems
- DALI-2 certified, 1-100 % dimming range
- DIP switch setting for the output current for simple adjustment
- Low current ripple, complying with IEEE 1789 recommendations
- Available in white, black and grey enclosures
- Optional accessory nipple available for mounting the luminaire part

Functional Description

- Adjustable constant current output: 350 mA to 700 mA (default)
- Output current adjustable through DIP switches
- Suitable for e.g. flicker-free camera recording applications
- Open circuit, short circuit, overload, overvoltage and overtemperature protection
- See the compatibility chart for different track systems on last page

Mains Characteristics

Nominal rated voltage range	220 V – 240 V, 0 / 50 – 60 Hz
AC voltage range	198 VAC – 264 VAC
DC voltage range	176 VDC - 280 VDC
Mains current at full load	Max. 0.19 A
Frequency	50 Hz – 60 Hz
Standby power consumption	< 0.3 W
THD at full power	< 10 %
Tested surge protection	1 kV L-N (IEC 61000-4-5)
	2 kV L/N-GND (IEC 61000-4-5)
Tested fast transient protection	2 kV (IEC 61000-4-4)

Insulation between circuits & driver case

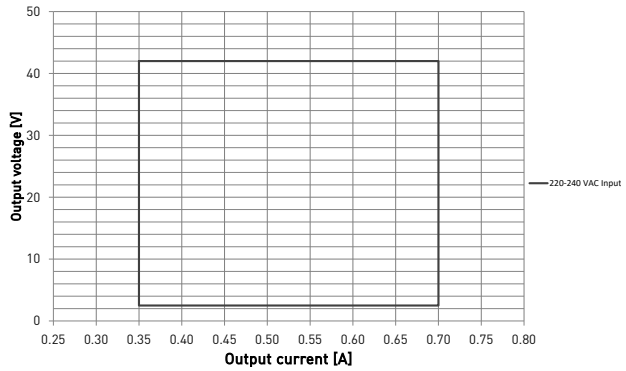
Mains circuit - SELV circuit	Double/reinforced insulation
DALI circuit - SELV circuit	Double/reinforced insulation
Mains circuit - DALI circuit	Basic insulation
Mains, DALI and output - Driver case	Double/reinforced insulation

Load Output (SELV <60 V)

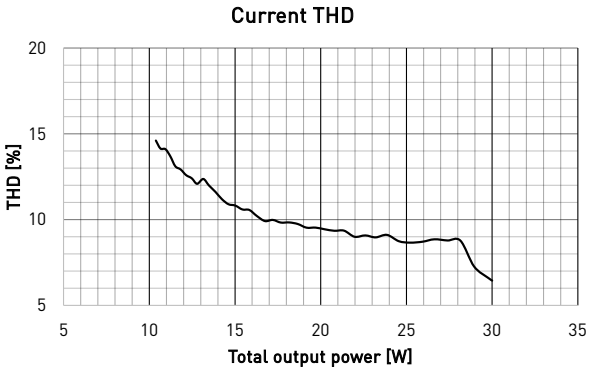
Output current (I_{out})	350 mA – 700 mA (default)
Accuracy	± 5 %*
Ripple	< 3 % at ⩽ 120 Hz
	*) Accuracy ± 7 % when current output < 400 mA
PstLM	< 0.05*
SVM	< 0.01*
	*) At full power, measured with Cree XP-G LED modules.
U_{out} (max) (abnormal)	60 V

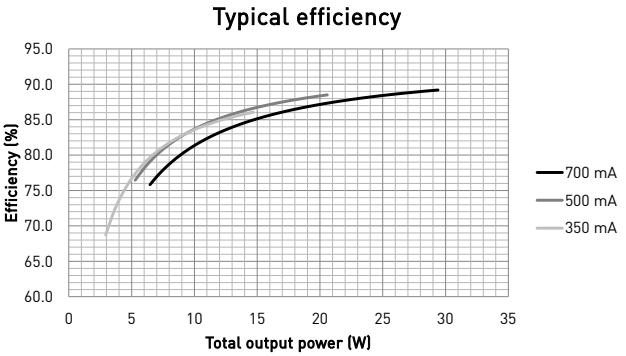
I_{LED}	350 mA	500 mA	700 mA (default)
P_{Rated}	0.9...14.7 W	1.25...21 W	1.75...29.4 W
U_{LED}	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V
PF (λ) at full load	0.94	0.98	0.98
Efficiency (η) at full load	87 %	88 %	88 %

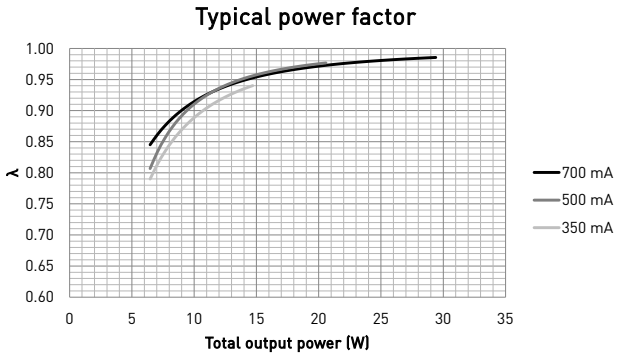
Operating window and driver performance



1) From 600 mA to 700 mA, full dimming range (1 % - 100 %) available in the whole area.
2) From 350mA to 600 mA, the absolute minimum dimming level is limited to 6 mA.







Operating Conditions and Characteristics

Absolute highest allowed t_c point temperature	60 °C
Tc life (50 000 h) temperature	60 °C
Ambient temperature range	–20 °C ... +35 °C*
Storage temperature range	–20 °C ... +60 °C
Maximum relative humidity	No condensation
Mains switching cycles	> 100 000 cycles
Life time (90 % survival rate)	50 000 h, at t_c = 60 °C

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

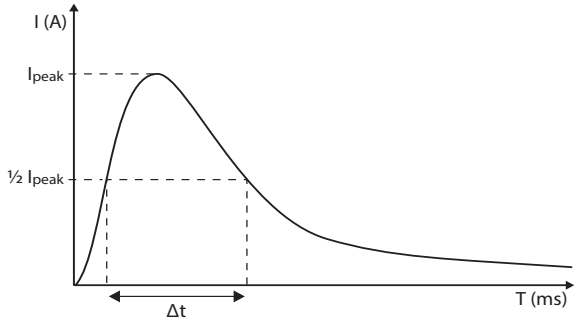
Quantity of drivers per miniature circuit breaker 16 A Type C

Based on inrush current I_{peak}	Typ. peak inrush current I_{peak}	1/2 value time, Δt
67 pcs*	9 A	33 µs

*the inrush current is not the limiting factor for the products per MCB, please notice the continous current limitations.

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 %

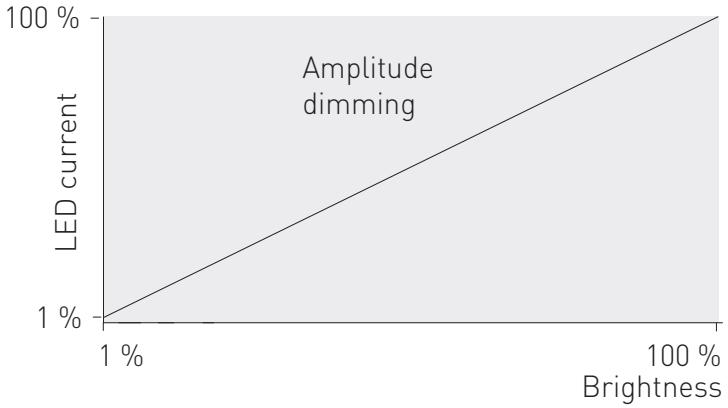


CONTINOUS CURRENT

Total continous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continous current: $n(I_{cont}) = (16\ A\ (I_{nom,Ta}) / \text{"nominal mains current with full load"}) \times 0.76)$. This calculation is an example according to recommended precautions due to multiple adjacent circuit breakers (> 9 MCBs) and installation environment (T_a 30 degrees); variables may vary according to the use case. Both inrush current and continous current calculations are based on ABB S200 series circuit breakers. More specific information in ABB series S200 circuit breaker documentation.

NOTE! 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.

Amplitude dimming technology



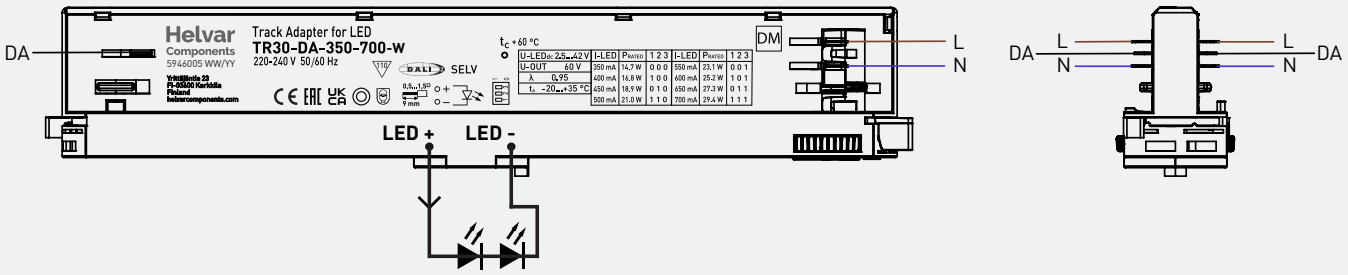
Dimming range	Dimming technology
1 % – 100 %	Amplitude (DC)

TR30-DA-350-700 LED driver implements amplitude dimming technology across whole dimming range. Amplitude dimming offers the best available technology for dimming the light output in an accurate and flicker-free way to ensure high quality lighting in even the most demanding situations such as camera recording applications. Amplitude dimming technology complies with IEEE 1789-2015 recommendations of current modulation to mitigate health risks to viewers.

Connections and Mechanical Data

Wire size	0.5...1.5 mm^2
Wire type	Solid core and fine-stranded
Wire insulation	According to EN 60598
Maximum driver to LED wire length	20 cm
Weight of the track adapter	151 g
Max withstand weight for luminaire part	5 kg
IP rating	IP20

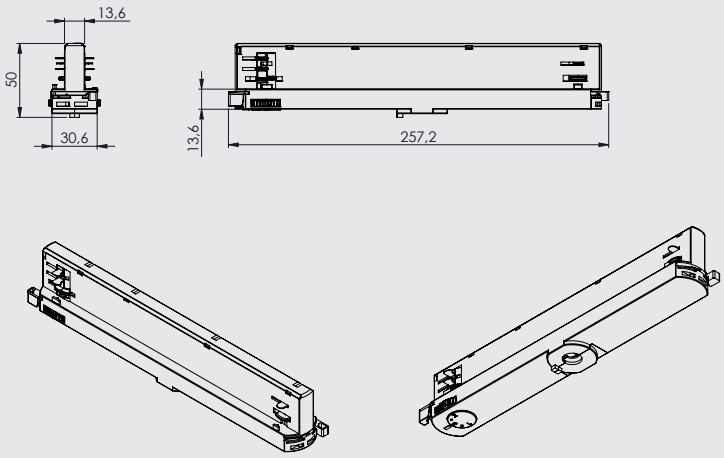
Connections



Note:

- *Not suitable for load side switching operation*

Dimensions



In TR30-DA-350-700, the current can be set with DIP switches. With each combination of switch setup, a different output current value can be set. The maximum value can be reached with all switches set to "1" (pushed towards the output connectors see connections picture above) and minimum with all switches set to "0". The output current values according to the DIP switch settings are presented below.

DIP switch combinations, output currents and voltage ranges

Dip Switch combination	000	100	010	110	001	101	011	111 (Default)
I_{out} (mA)	350	400	450	500	550	600	650	700
Voltage range	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V	2.5 - 42 V

TR30-DA-350-700 LED driver is suited for usage in mains voltage track systems and luminaires. 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.

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.

Functionality in abnormal conditions

No load
Output voltage will rise to maximum and return to normal level when load is reconnected.

Short circuit
The driver can withstand short circuit at output side and continue normal operation once the connection fault has been resolved.

Overload
The driver can withstand temporary overload situation and continue normal operation once the load has been corrected.

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 IEC 61000-3-2
Limits for voltage fluctuations and flicker	EN 61000-3-3
Radio frequency interference	EN IEC 55015
Immunity standard	EN 61547
Performance requirements	EN IEC 62384
Digital addressing lighting interface:	
General requirements for DALI system	EN 62386-101 (DALI-2)
Requirements for DALI control gear	EN 62386-102 (DALI-2)
Requirements for control gear of LED modules (DALI Device Type 6)	EN 62386-207 (DALI-2)
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	
CE / UKCA marked	

Label symbols


Safety isolating control gear with short circuit protection (SELV control gear).


Double insulated control gear suitable for built-in use.

Thermally controlled control gear, incorporating means of protection against overheating to prevent the case temperature under any conditions of use from exceeding 110 °C.

DALI-2 certified control gear.

Order codes and compatibility

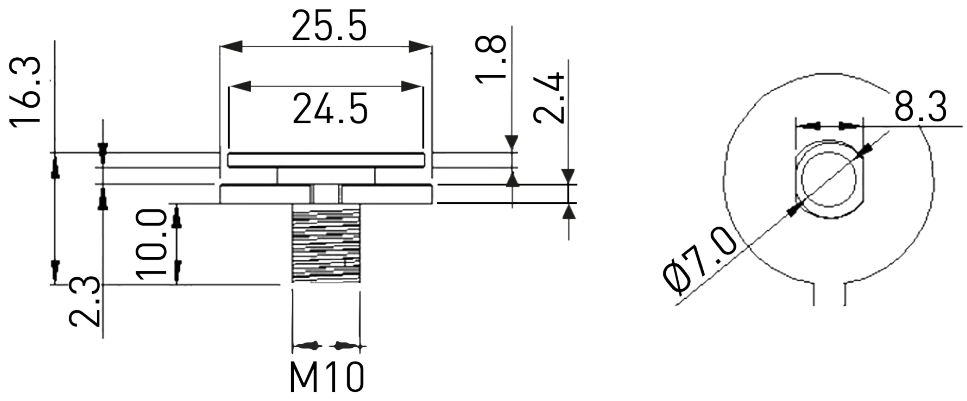
ORDER CODES FOR DIFFERENT COLOURS

	Order code	Product name	Driver enclosure colour	Colour code
TR30-DA-350-700				
Product order codes	5946005	TR30-DA-350-700-W	White	RAL 9010
	5946105	TR30-DA-350-700-B	Black	RAL 9005
	5946205	TR30-DA-350-700-G	Grey	RAL 7036

ORDER CODE FOR ACCESSORY NIPPLE

Optional accessory nipple is available for mounting the luminaire part, details and order code presented below.

	Order code	Product name	Dimensions	Material
Product order code	9500005	TRACK DRIVER ACCESSORY NIPPLE	M10 x 10 mm	Zinc alloy



COMPATIBILITY FOR TRACK SYSTEMS

	Manufacturer	Track system type
TR30-DA-350-700 compatibility		
Track system	Nordic Aluminium	GLOBAL Trac Pro XTS 4 & XTSF 4
	A.A.G. Stucchi	One Track 9000XX Series
	Eutrac	25-XX
	Unipro	T32B
	Ivela	7501

Note: The list is not exhaustive, but includes the track system variants tested for compatibility. Helvar Components can't take responsibility on any possible changes made by different track system manufactures that could affect the compatibility between 3rd party track systems and Helvar Components adapters for LEDs.