

eldoLED

Artikel-Nr. EC25CA-E1ZHP

**20W Compact (CA) Family
Stand-alone LED Drivers**
Designed for Europe



The eldoLED 20W compact LED driver family is designed for downlighting applications in Europe. The plastic housing is optimized to fit through small cut-outs (down to 45mm) and includes a strain relief.

This dimmable family includes ECOdrive (dimming to 1%), SOLOdrive (dimming to 0.1%, as well as a Dim to Warm version) and DUALdrive (Tunable White) versions.

Supported control protocols include DALI-2 DT6 and DT8, Pulse dimming, 0-10V, Phase dimming and LEDcode2 devices.

The DALI and 0-10V products have a LEDcode interface for programming. The Phase dimming drivers have a 4-level dipswitch for setting the current. Drivers with DALI-2 DT6 controls can be connected to a Casambi wireless control module by eldoLED.

Applications

- Downlight
- Commercial (hospitality, office, healthcare)
- Residential

Key Features and Benefits

- Compact size:
Enabling smaller downlights, pendants and spotlights. Stand-alone (independent) drivers that fit through 45mm aperture with 100mm plenum ceiling.
- Natural and flicker-safe dimming:
Dimming with smooth brightness changes and excellent flicker performance. Configurable minimum dim level* and adaptable dim curves*. Hybrid HydraDrive dimming technology* is proven to work in TV studios and security camera environments.
- Programmable*:
Fine-tune your driver for any application across a wide operating window using FluxTool with LightShape. Programmable features vary per model and include:
 - Dimming level
 - Output current (1mA resolution)
 - Dimming curve
 - Dim to Warm, using LightShape
 - Tunable White, using LightShape
- Performance:
Constant current SELV output to LEDs. European mains input (220-240VAC), low inrush current and total harmonic distortion. Suitable for use up to 50°C ambient temperature. Supports central battery (DC) emergency.*

* Applies to DALI models.

Specifications and Certifications

CASAMBI  LEDcode2

 Phase dim  Pulse dimming

Products

Product	Max Power	Dimming* and Tuning	Output Current Range	Output Voltage Range	Control Protocol	LEDcode2**	Order Number
ECOdrive	20W	Dim to 1%	400-460-520-580mA	20-40 V	Phase dimming	No	EC20CA-E1ZHP
ECOdrive	25W	Dim to 1%	350-500-550-700mA	20-39 V***	Phase dimming	No	EC25CA-E1ZHP
ECOdrive	20W	Dim to 1%	150-1050 mA	2-40 V	DALI-2 DT6 Pulse dimming	Yes	EC20CA-E1Z0D
ECOdrive	20W	Dim to 1%	150-1050 mA	2-40 V	0-10V	Yes	EC20CA-E1Z0A
SOLOdrive	20W	Dim to 0.1%	150-1050 mA	2-40 V	DALI-2 DT6 Pulse dimming	Yes	SL20CA-E1Z0D
SOLOdrive	20W	Dim to 0.1%	150-1050 mA	2-40 V	0-10V	Yes	SL20CA-E1Z0A
SOLOdrive	20W	Dim to Warm	150-1050 mA	2-40 V	DALI-2 DT6	Yes	SL20CA-E2Z0D
DUALdrive	20W	Tunable White	150-1050 mA	2-40 V	DALI-2 DT6	Yes	DL20CA-E2Z0D
DUALdrive	20W	Tunable White	150-1050 mA	2-40 V	DALI-2 DT8	Yes	DL20CA-E2Z0C

* Minimum dim level for Phase dimming depends on dimmer, see Application Note.

** LEDcode2: to connect the driver to a Casambi wireless control module by eldoLED, or for LEDcode Cross applications.

*** for 700mA: 20-37V

Compact Stand-alone Family - Datasheet

Ordering Guide

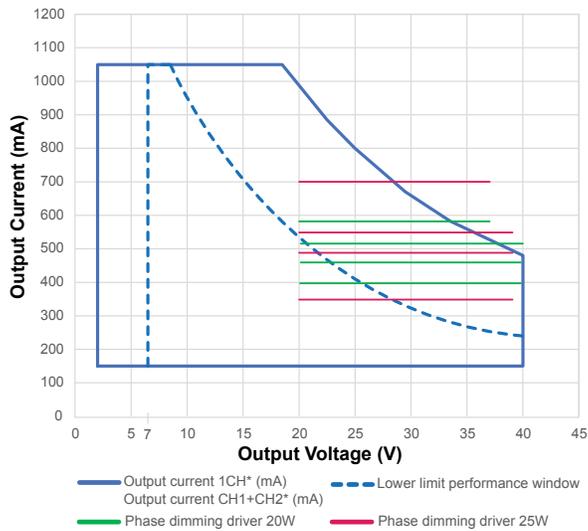
EC	20	CA	E	1	Z0	D
Family	Output Wattage	Housing	Input Voltage	Output Channels	AUX Voltage	Control
EC = ECOdrive	20W	C = Compact	E = 220-240VAC	1 = 1 Output	Z0 = No AUX Output	D = DALI DT6
SL = SOLOdrive	25W	A = With Strain Relief		2 = 2 Outputs	ZH = No AUX, High LED voltage (20-40V)	C = DALI DT8
DL = DUALdrive						A = 0-10V P = Phase dimming

Electrical Specifications

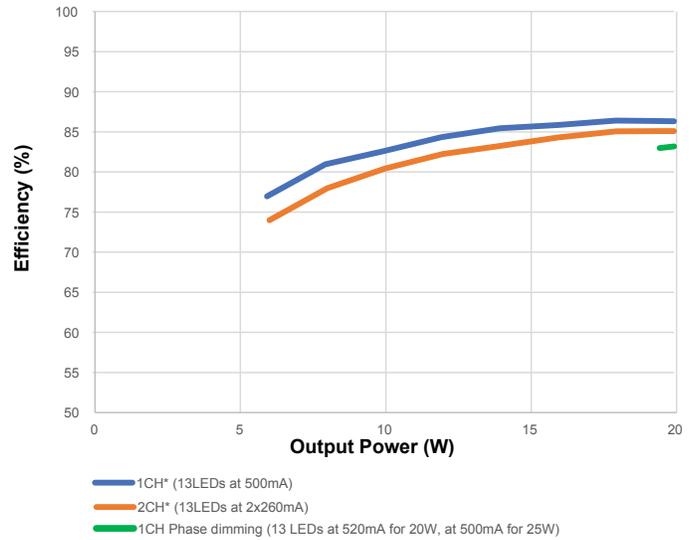
Max Output Power	Nominal Input Voltage	Max Input Current	Typ. Power Factor at Full Load	Typ. THD at Full Load	Typ. Max Standby Power	Inrush, Max on Circuit Breaker	Surge Protection	Typ. Efficiency at Full Load	Typ. Max Tc
Phase dim 20W	220-240VAC	0.12A @ 230VAC	>0.95	<10%	Not applicable	106 on B16	1kV differential L-N 2kV common L-N	83%	85°C
Phase dim 25W	220-240VAC	0.14A@230VAC	>0.95	<10%	Not applicable	85 on B16,	1kV differential L-N 2kV common L-N	83%	85°C
DALI 20W	220-240VAC	0.15A @ 230VAC	>0.95	<10%	<0.5W	106 on B16	2kV differential L-N 2kV common L-N	82%	85°C
0-10 20W	176-250VDC	0.15A @ 230VAC	>0.95	<10%	<0.5W	106 on C16	2kV common L-N	82%	85°C

Compact Stand-alone Family - Datasheet

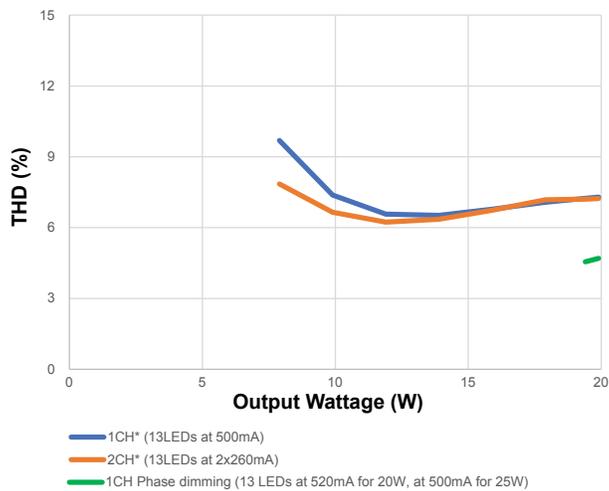
Operating Window



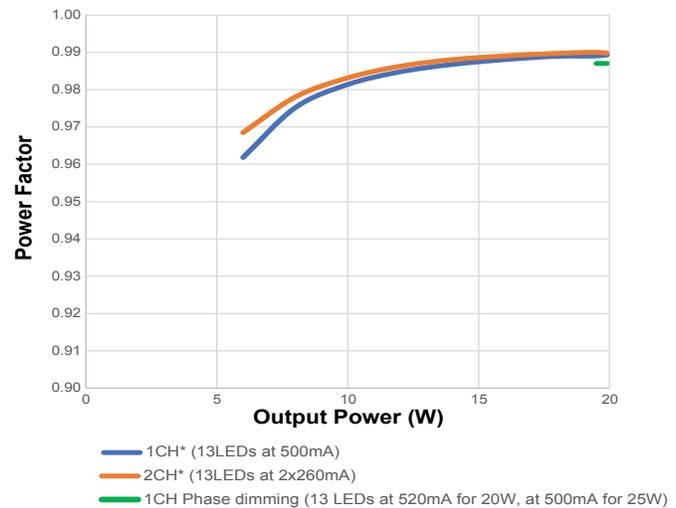
Typical Efficiency vs Load**



Typical THD vs Load**



Power Factor**



* 1 Channel drivers are ECOdrive and SOLOdrive. 2 Channel drivers are SOLOdrive Dim to Warm and DUALdrive.

** Tested with a load of 13 LEDs in series, programmed for 500mA (1 channel driver*) or 2x260mA (2 channel drivers*) at 25°C ambient temperature. The measurements below 20W were performed by dimming the light output.

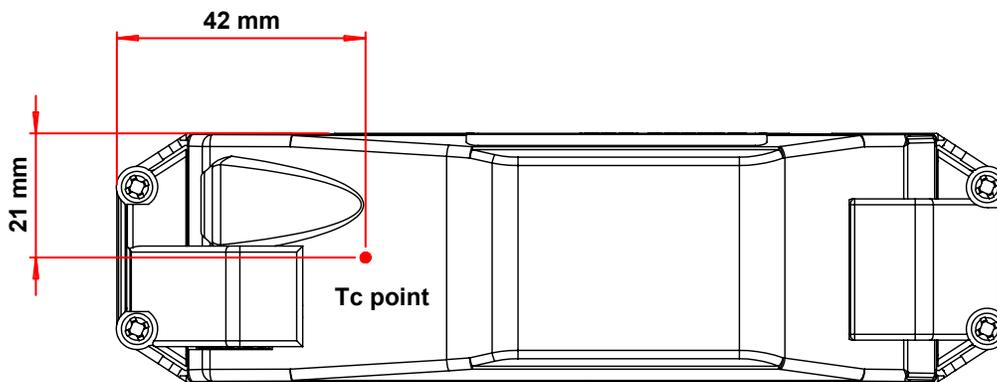
Compact Stand-alone Family - Datasheet

Minimum and Maximum Ratings

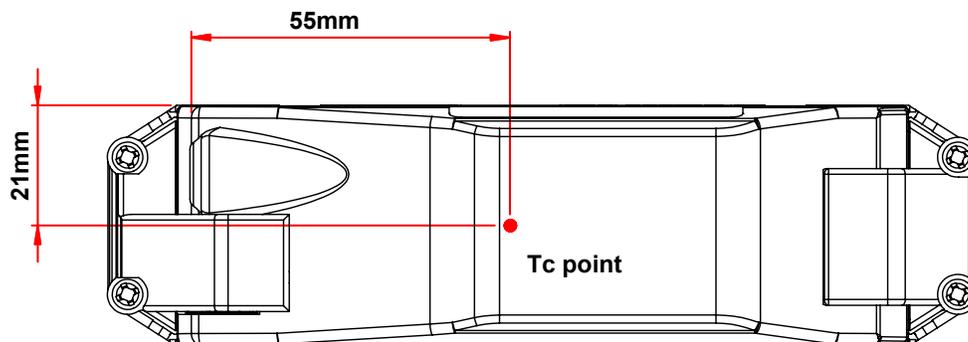
Parameter	Values
Input Voltage Range (DALI / 0-10V versions)	196-264VAC and 176-250VDC
Input Voltage Range (Phase dimming)	220-240VAC
Ambient Operating Temperature	-20°C to 50°C (DALI / 0-10V); -20°C - 45°C (Phase dimming)
Lifetime	50,000 hours at maximum case temperature (Tc) Lifetime doubles per 10°C below Tc

Tc Point Location

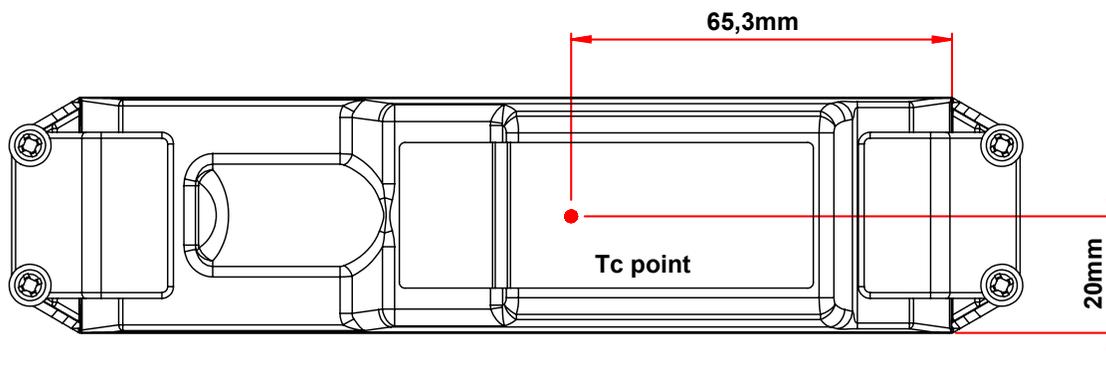
ECODrive 1 channel (Phase dimming)



ECODrive, SOLOdrive 1 channel (DALI / 0-10V)



DUALdrive, SOLOdrive 2 channels (DALI)



Compact Stand-alone Family - Datasheet

Programming Tools

	DALI / 0-10V	Phase dimming
Programming Software	FluxTool 4.6.9 or higher	none
Programming Interface: TOOLbox pro	TLU20505/TLU20504	Current setting via Dipswitch (4 settings)
TOOLbox Adapter	TLA20502	none
Programming Cable	TLC03051	none
Handheld Programming Tool	PJ0035HH1	none
Programming Jig	PJ0200A1	none

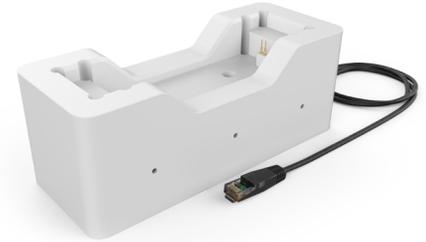
Programming Interface



Handheld Tool



Typical Jig

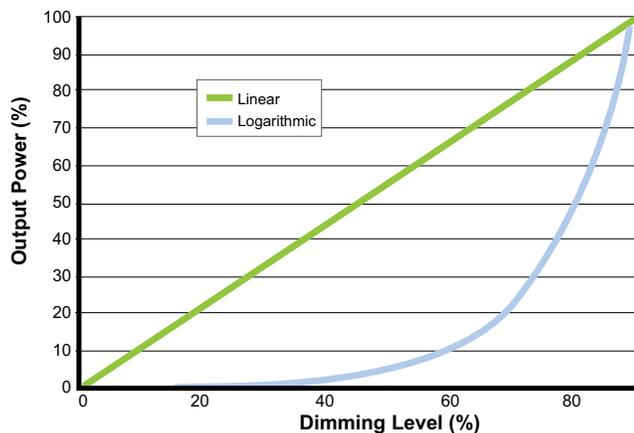


Programming Parameters

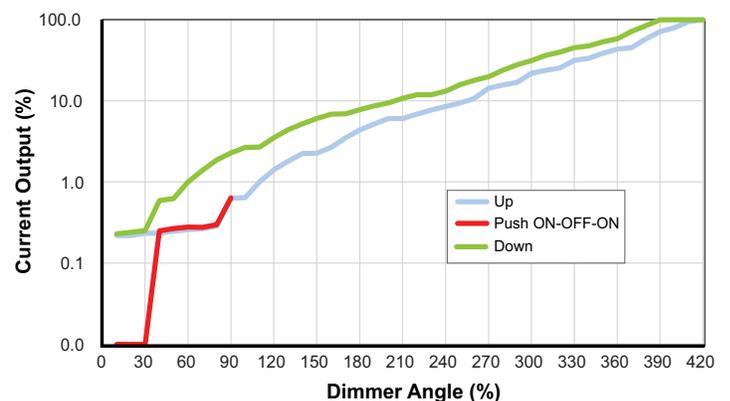
LED Output Current (DALI / 0-10V)	1 mA resolution
LED Output Current (Phase dimming)	4 discrete currents can be selected with Dipswitch
Dimming Curve (DALI / 0-10V)	LOG - Logarithmic (default) LIN - Linear SLN - Soft-linear (0-10V model only) SQU - Square (0-10V model only)
Minimum Dim Level (DALI / 0-10V)	Settable in 0.1% increments down to 1% (ECOdrive) or 0.1% (DUALdrive, SOLOdrive)

Dimming Curves

DALI / 0-10V



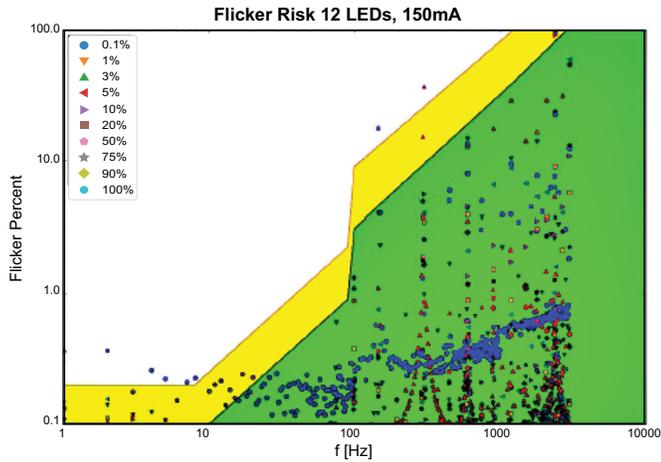
Phase Dimming



Compact Stand-alone Family - Datasheet

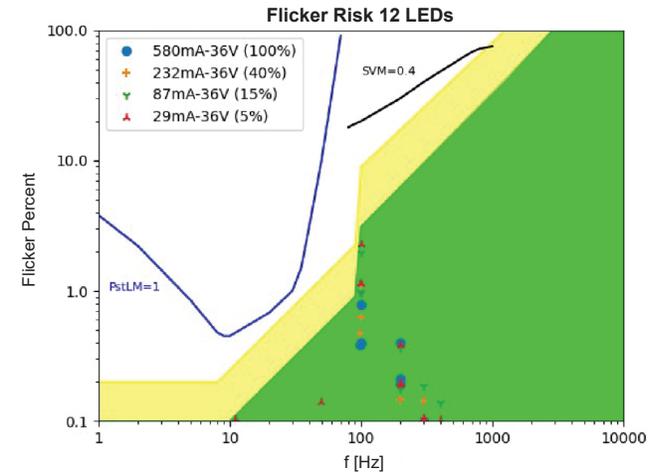
Flicker Performance*

DALI / 0-10V



* 0.1% data are not applicable for ECOdrive range

Phase Dimming



Wiring and Connector Lay Out

	Input	Output
Connector Type	Screw terminal TE 2-796683, or alike	Push in terminal Wago 250, or alike
Wire Type	Solid or stranded copper	Solid or stranded copper
Wire Dimensions	0.5-3mm ² (DALI, 0-10V) 0.5-1.5mm ² (Phase dimming)	0.5-1.5mm ² (DALI, 0-10V) 0.5-0.75mm ² (Phase dimming)
Wire Strip Length	9mm (DALI, 0-10V) 6mm (Phase dimming)	9mm (DALI, 0-10V) 6mm (Phase dimming)
Maximum Length To Fixture		2m for independent use

Connector Lay Out

ECOdrive 1 channel (Phase dimming)

	20W	25W		
1=OFF 2=OFF	400mA	350	L	LED output +
1=ON 2=OFF	460mA	500	N	LED output -
1=OFF 2=ON	520mA	550	ON	
1=ON 2=ON	580mA	700	1 2	

ECOdrive, SOLOdrive 1 channel (DALI / 0-10V)

L +	LED output +
N -	LED output -
0-10V +/DALI +	LEDcode/NTC +
0-10V -/DALI -	LEDcode/NTC -

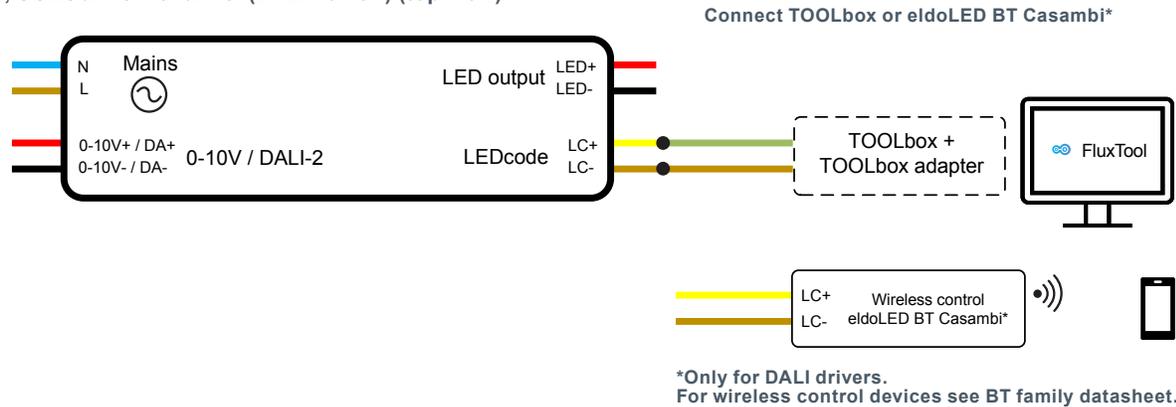
DUALdrive, SOLOdrive 2 channels (DALI)

L +	LED output 1 +
N -	LED output 1 -
DALI +	LED output 2 +
DALI -	LED output 2 -
	LEDcode/NTC +
	LEDcode/NTC -

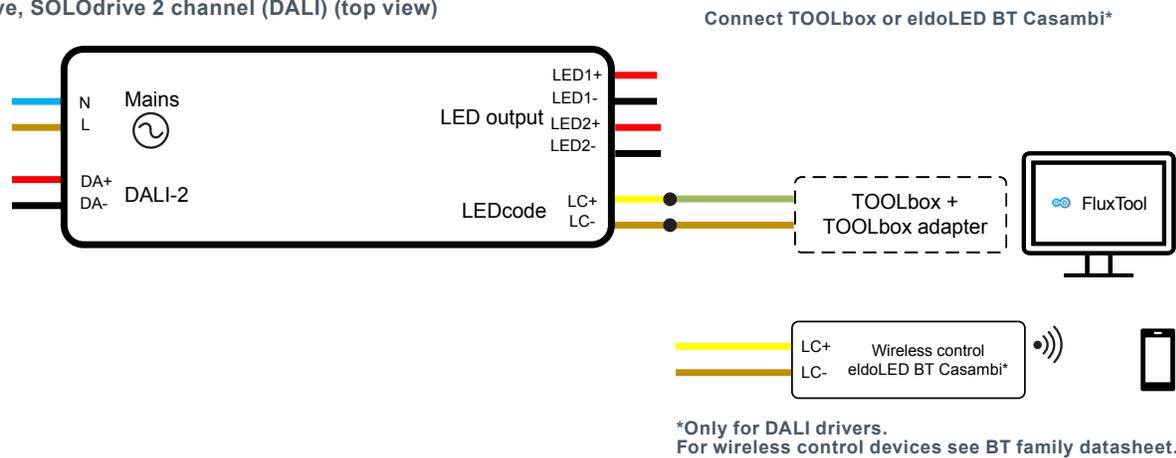
Compact Stand-alone Family - Datasheet

Wiring Diagram

ECOdrive, SOLOdrive 1 channel (DALI / 0-10V) (top view)



DUALdrive, SOLOdrive 2 channel (DALI) (top view)



ECOdrive (Phase Dimming) (top view)



Dimmers

List of tested Phase dimming dimmers:

Europe	UK
ECODim 04	Varilight V-com MKP100
Busch Jaeger 6523 U102	Zano ZMD150
Jung GIRA 2455 00 (System 3000)	Focus SB FOC-400BV
SG LEDDIM 400	Honeywell MK K1523WHILV
ION ID200W (Mk2)	

Notes:

Test results are available on request with eldoLED Sales.

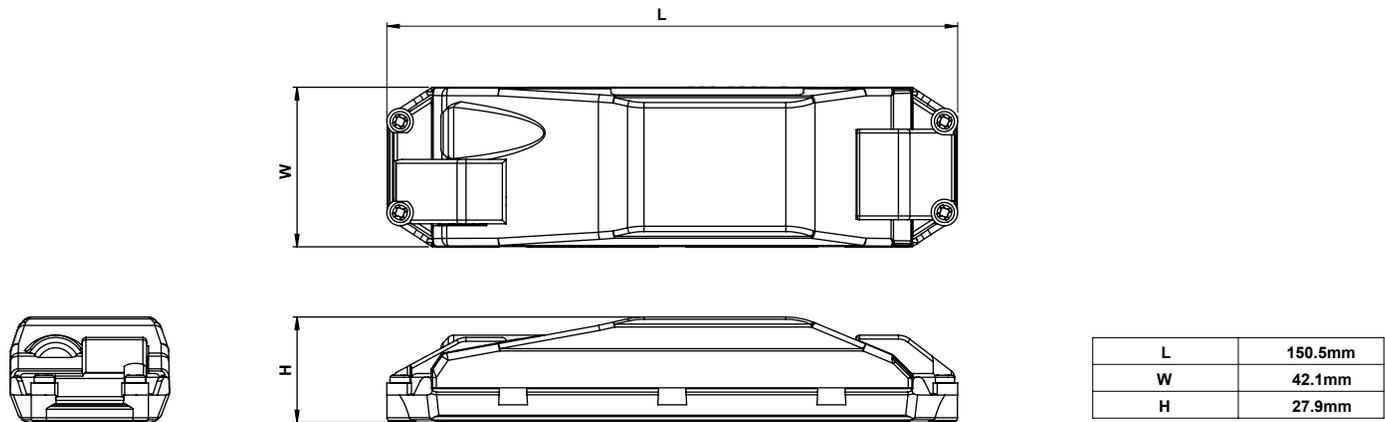
The dimming performance of Phase dimming products depends on the type of dimmer used.

Minimum dimming level or restart level can vary and depend on the amount of LED drivers connected.

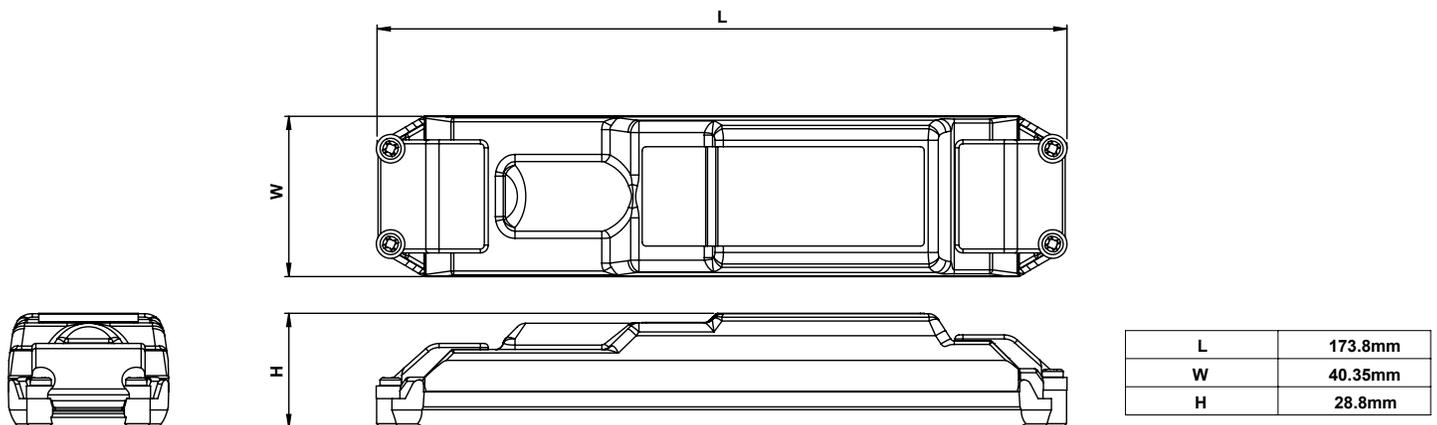
Compact Stand-alone Family - Datasheet

Mechanical Details	ECOdrive, SOLOdrive 1 channel	DUALdrive, SOLOdrive 2 channels
Length x Width x Height	150.5 x 42.1 x 27.9mm	173.85 x 40.35 x 28.8mm
Weight of individual product	105g (DALI), 123g (Phase dimming), 110g (0-10V)	117g
Packaging	50 pcs per box	50 pcs per box
Box Weight	6.3kg (DALI), 6.9kg (Phase dimming), 6.6kg (0-10V)	7kg
Box Dimensions	579 x 237 x 202mm	579 x 237 x 202mm

ECOdrive, SOLOdrive 1 channel



DUALdrive, SOLOdrive 2 channels



Compact Stand-alone Family - Datasheet

LED Driver Protection

Thermal	The LED output current is automatically decreased whenever the internal driver temperature exceeds a factory preset temperature. The LED output current is increased once the internal driver temperature drops below the preset temperature threshold. If the internal driver temperature continues to increase, despite a decrease in output current, the LED driver will eventually shut down.
LED Output Short Circuit	The LED output current is cut off whenever the LED driver detects a shortcircuit. The LED driver will attempt a restart every 400ms after a short-circuit is detected.
LED Output Open Circuit	The LED output is turned off whenever the LED driver detects an open circuit. The LED driver will attempt a restart every 400ms after an open circuit is detected.
LED Output Overload	The driver monitors the LED output load. Whenever the output load exceeds the maximum output power rating of the LED driver, the output current is sequentially scaled down until the cumulative load drops below the maximum output power rating of the LED driver.
Reverse Polarity	The LED driver will not yield any current if the polarity of the load on the LED output is reversed. This situation will not damage the LED driver but may damage the LED load.

LED Protection (DALI / 0-10V versions)

Thermal Protection LED	An external NTC thermistor, which is placed on a PCB near the LEDs, can be connected to the driver via the LEDcode/ NTC terminals. The output current to the LEDs is then decreased by 75% whenever the NTC exceeds a maximum allowable temperature, which is specified by the user in the FluxTool software. The default NTC temperature limit is set to 70°C.
Thermistor Value	47kΩ
Suitable Thermistors	leaded: Vishay, P/N 238164063473 screw: Vishay, P/N NTCASCWE3473J

Standards and Compliance

ENEC safety	EN 61347-1 EN 61347-2-13 (Emergency lighting)
ENEC performance	EN 62384
Conducted emissions	EN 55015
Radiated emissions	EN 55015
Radio disturbance characteristics	EN 66022
Harmonic current emissions	EN 61000-3-2
Electrostatic discharge	EN 61000-4-2
RFE field susceptibility	EN 61000-4-3
Electrical fast transient	EN 61000-4-4
Surge immunity	EN 61000-4-5
Conducted radio frequency	EN 61000-4-6
Voltage dips	EN61000-4-11
Electromagnetic immunity	EN 61547
ECODesign 2019/2020	Flicker for LED: Pst LM ≤ 1.0 at full load Stroboscopic effect for LED: SVM ≤ 0.4 at full load
DALI-2	IEC 62386-101 Edition 2.0, IEC 62386-102 Edition 2.0, IEC 62386-207 Edition 1
0-10V	IEC/EN 60929 annex E NOTE: From 0.6V to 10V eldoLED LED drivers comply with IEC/EN 30929 annex E. Below 0.6V eldoLED LED drivers comply with ABL 0-10V Design Spec v1.2 enabling standby mode. For detailed dimming characteristics see 0-10V response chart in Control Characteristics.
Surge protection	IEC 61000-4-5 level3: 2kV DM, 2kV CM @ 20m
Restriction of hazardous substance	RoHS3 (Directives 2011/65/EU-2015/863/EU)
SVHC-list substances	REACH Art 33

Compact Stand-alone Family - Datasheet

Safety



Risk of electrical shock. May result in serious injury or death. Disconnect power before servicing or installing.



The LED driver may only be connected and installed by a qualified electrician. All applicable regulations, legislation, and building codes must be observed. Incorrect installation of the LED driver can cause irreparable damage to the LED driver and the connected LEDs. Pay attention when connecting the LEDs: polarity reversal results in no light output and often damages the LEDs.



LED drivers are designed and intended to operate LED loads only. Powering non-LED loads may push the LED driver outside its specified design limits and is, therefore, not covered by any warranty.



eldoLED products are designed to meet the performance specifications as outlined at certain operating conditions in the datasheet. It is the responsibility of the fixture manufacturer to test and validate the design and operation of the system under expected and potential use cases, including faults.



Please observe voltage drop over long cable lengths. Longer cable lengths increase EMI susceptibility.



Product renderings and dimensional drawings are generic for the housing type. Product label, connector type and quantity may vary.

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Warranty

eldoLED Products are covered by a 5-year limited warranty. This is the only warranty provided and no other statements in this datasheet create any warranty of any kind. All other express and implied warranties are disclaimed.
Complete warranty terms can be found at: www.eldoled.com/legal/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.
The product images shown are for illustration purposes only and may not be an exact representation of the product.
Specifications subject to change without notice.