



General Information

Type	Constant Current
Output Power	12W
Housing Type	Side feed (with or without flanges)

Programing

Toolbox Pro (required)	TLU20505 (*277HWN)
Toolbox Adapter (optional)	TLA20502 (*277HWF)
Programming Hand-held Tool	*2797N2
Software	FluxTool 4.5.26 or higher
Programmable Features	Output Current Minimum Dimming Level Dimming Curve AUX Voltage/standby (AUX models only)

Environmental Specifications

Ambient Operating Temperature	-20°C to 50°C (performance) -40°C to 50°C (functional)
Max. Case Temperature (Tc)	75°C
Max. Storage Temp.	75°C
UL Environmental Rating	Dry and Damp
IP Rating	IP20
Acoustic Noise (steady state)	<24 dBA (Class A)
Lifetime	50,000 hours at max. cast temperature (Tc) of 75°C

Standards and Compliances

UL Listed, Class P	UL 1310, UL 8750 (Class 2 Output)
California Title 24 / JA8	Meets start up requirements of <500ms
EMI (radiated and conducted)	FCC Title 47 CFR part 15 Class B
Electrostatic Discharge	EN 61000-4-2
Surge Protection (line)	ANSI 62.41 1991 category B1: 2.5kV DM, 2.5kV CM @ 30 Ohm
Surge Protection (control)	1 kV CM mode, DM mode <30V
RoHS	RoHS3 (Directives 211/65/EU-2015/863/EU)
SVHC-List Substances	REACH Art.33

Note: Meets CA Title 24/JAB Start Time and Flicker requirements (ECOdrive and SOLOdrive models only)

Products

Item Number	Model	AUX Output	Supported Controls
*280K9S	EC12S-M1Z0A1	No	0-10V
*280K9T	EC12S-M1Z0D1	No	DALI-2 and LEDcode2.1
*280K9U	EC12S-M1M0Z1	Yes	LEDcode2.1
*280KA0	EC12S-M1Z1A1	No	0-10V
*280KA2	EC12S-M1Z1D1	No	DALI-2 and LEDcode2.1
*280KA3	EC12S-M1M1Z1	Yes	LEDcode2.1

Electrical Specifications

Input

Input Voltage Nominal	120-277VAC (UL)	
Input Voltage	108-305VAC	
Frequency Range	50-60Hz	
	120 V	277V
Input Current Max.	0.22A @ 60Hz	0.10A @ 60Hz
THD at Full load	<20%	<20%
Power Factor at Full load	>0.95%	>0.95%
Efficiency at Full load	82%	84%
Inrush Current Max.	<200mA ² s	<200mA ² s
Standby Protection Max. ¹	<0.5W	<0.5W
Surge Protection	2.5kV differential mode (DM) 2.5kV common mode (CM) for mains 1.0kV common mode (CM) for DALI and 0-10V control lines	

Output

Number of LED Outputs	1
Programmable LED Output Current	150-950mA
Output Current Resolution	Programmable in 1mA increments Within specified current range
Output Current Tolerance	±5% at programmed output current
Output Voltage Range	12 - 42V (performance) 2 - 42V (functional)

¹ If no load is connected to AUX.

Dimming

Minumum Dimming	1%
Dimming Method	Hybrid HydraDrive
Time Delay to Standby	<25s
0-10V Source/Sink Current (0-10V models only)	0.6mA (Max.)



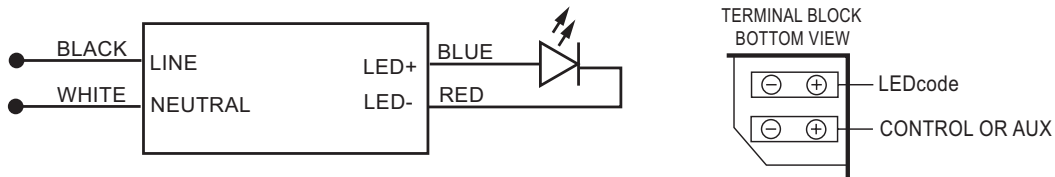
ECOdive 12W/S Small Form Factor - Technical Specifications

Ordering Information

Item Number	Model Name	Output Power	Output Current Range	Default Current Setting	Output Voltage Range	Control Protocol	AUX Output	Housing Type
*280K9S	EC12S-M1Z0A1	12W	150-950mA	350mA	2-42VDC	0-10V	No	S (side feed with flanges)
*280K9T	EC12S-M1Z0D1	12W	150-950mA	350mA	2-42VDC	DALI-2 and LEDcode 2.1	No	S (side feed with flanges)
*280K9U	EC12S-M1M0Z1	12W	150-950mA	350mA	2-42VDC	LEDcode 2.1	Yes	S (side feed with flanges)
*280KA0	EC12S-M1Z1A1	12W	150-950mA	350mA	2-42VDC	0-10V	No	S (side feed no flanges)
*280KA2	EC12S-M1Z1D1	12W	150-950mA	350mA	2-42VDC	DALI-2 and LEDcode 2.1	No	S (side feed no flanges)
*280KA3	EC12S-M1M1Z1	12W	150-950mA	350mA	2-42VDC	LEDcode 2.1	Yes	S (side feed no flanges)

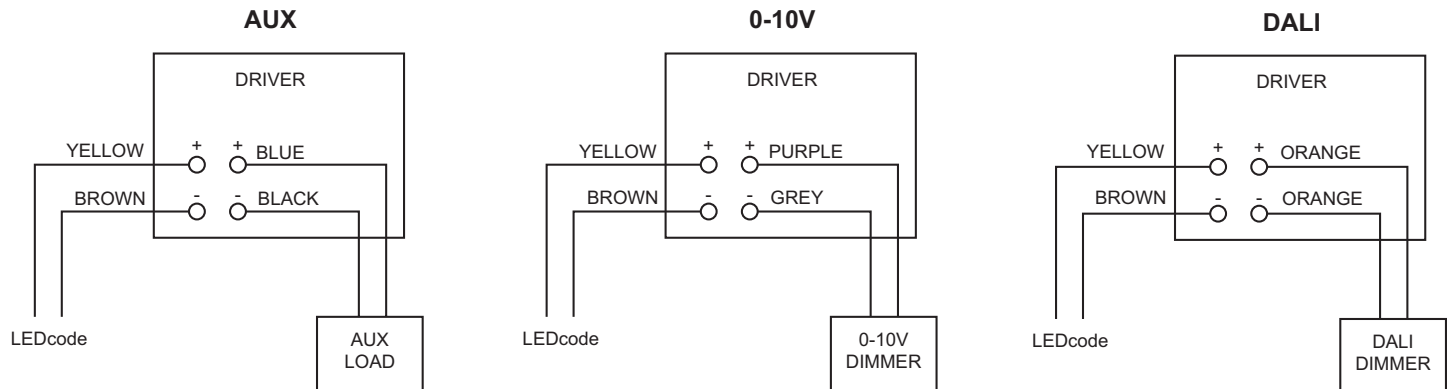
Wiring Diagrams

Terminal Connections



Note: Case must be properly grounded via studs (not shown)

AUX - Dimmer Schematics



Wiring Specifications

Wire Type	AWG 18 (strandedWith tinned ends)
Wire Length	Line In: 160mm / 6.3 in LED Output: 160mm / 6.3 in
Wire Strip Length	9.0mm

Automatic Circuit Breakers (MCB)

Maximum Loading	MCB type	B10	B13	B16	C10	C13	C16
	Number of LED Drivers (120VAC)	40	52	64	40	52	64
	Number of LED Drivers (277VAC)	102	133	164	102	133	164

Control / AUX Specifications

Connector Type	Push-in terminals
Connector Supplier and Series	WAGO 2059-302 series
Wire Type	Solid
Wire Core Cross section	AWG 20-26 ¹ (AWG 22-26 is recommended)
Wire Strip Length	5.5mm
Rework	The connector can be rework up to three times by removing an already inserted wire via a "twist and pull" motion.

¹ When rewiring after using AWG 20, only use AWG 20 (required). Using a higher gauge (smaller wire) may result in a loose connection and/or wire coming out.

Auxillary Output Characteristics¹

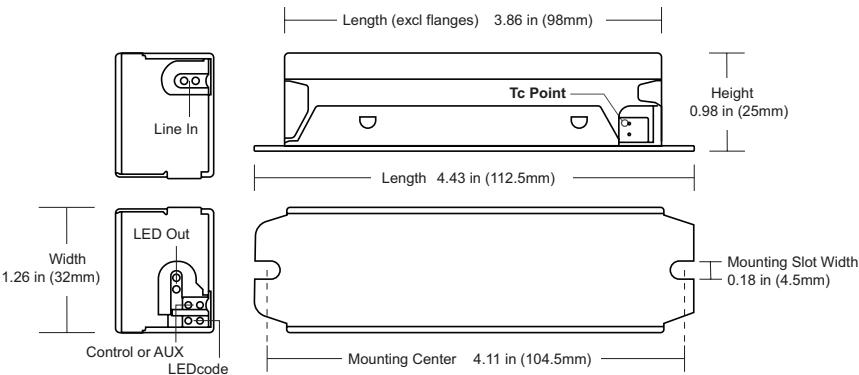
AUX Output Oltage Range	Settable in range 4-24VDC
AUX Output Current	100mA (maximum)
AUX Voltage Resolution	1V (if VAUX <16) and 2V (if VAUX is ≥16V)

¹AUX models only

ECOdive 12W/S Small Form Factor - Technical Specifications

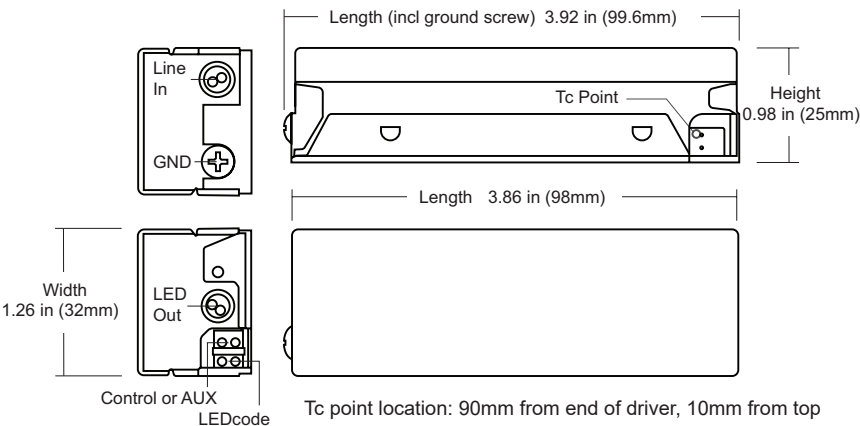
Mechanical Diagrams

Mechanical Specification	
Length	3.86" (98mm)
Width	1.26" (32mm)
Height	0.98" (25mm)
Mounting Length	2.0" (50.8mm)
Weight	150g
Mounting Torque	20 in / lbs

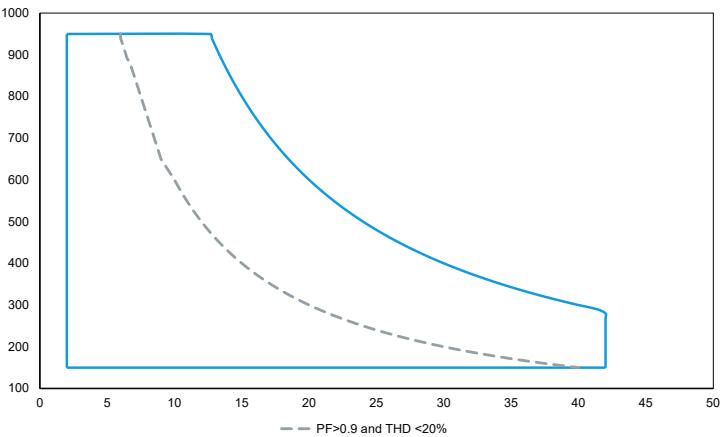


Mechanical Diagram - Side Feed Without Flange

Mechanical Specification	
Length	3.92" (99.6mm)
Width	1.26" (32mm)
Height	0.98" (25mm)
Weight	150g
Mounting Torque	20 in / lbs



Operating Window

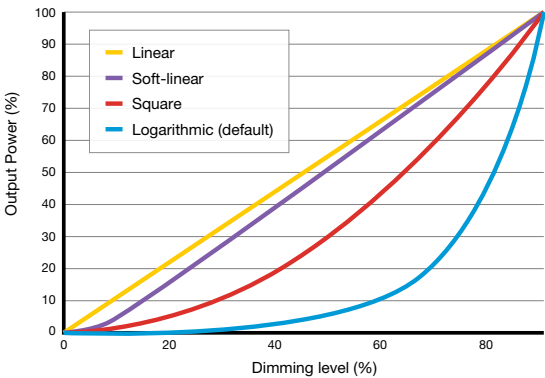


PF>0.9 and THD<20% for loads between 6W and 12W iso-power lines

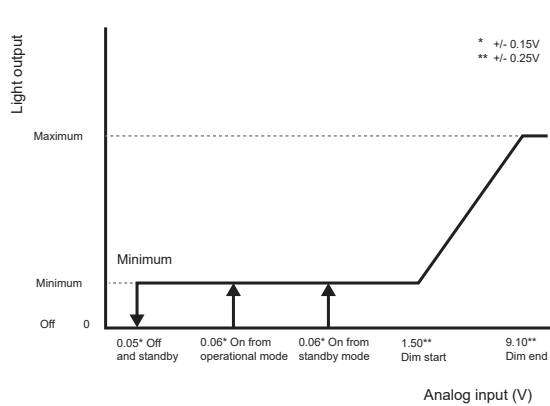
Control Details

Model Name	Supported Controls	Control Channels	Dimming curve options
EC12S-M1Z0A1	0-10V	1	Logarithmic (default), Linear, Soft-linear, Square
EC12S-M1Z0D1	DALI-2 & LEDcode 2.1	1	Logarithmic (default), Linear
EC12S-M1M0Z1	LEDcode 2.1	1	Logarithmic (default), Linear
EC12S-M1Z1A1	0-10V	1	Logarithmic (default), Linear, Soft-linear, Square
EC12S-M1Z1D1	DALI-2 & LEDcode 2.1	1	Logarithmic (default), Linear
EC12S-M1M1Z1	LEDcode 2.1	1	Logarithmic (default), Linear

Programmable Dimming Curves



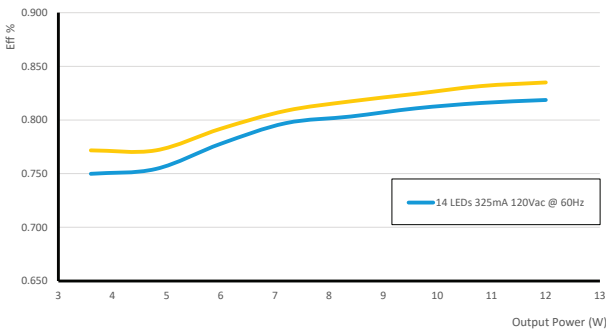
0-10V Dimming Characteristics applies to 0-10V models only



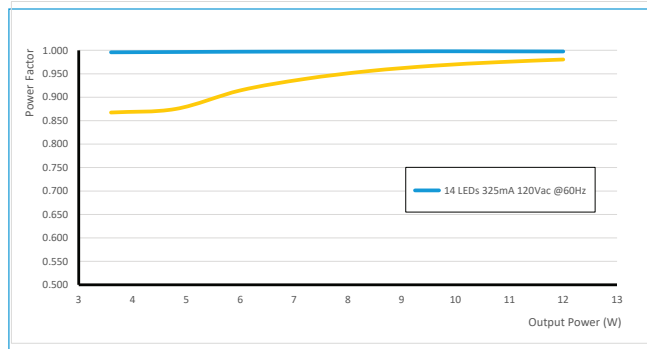
Performance

Performance data for typical efficiency, power factor, and THD was determined by testing a load of 14 LEDs in series, programmed for 550mA, and at 25°C ambient temperature. The measurements below 12W were performed by dimming the light output.

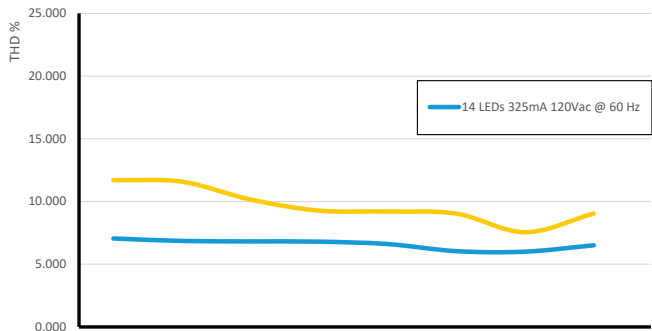
Typical Efficiency vs. Load



Typical Power Factor vs. Load

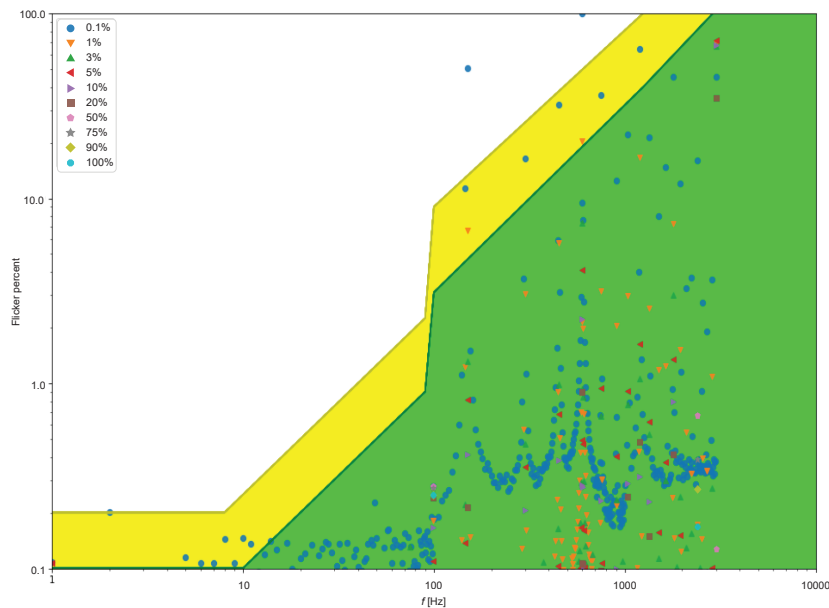


Typical THD vs. Load



Typical Flicker Performance

This chart shows typical flicker percent as a function of frequency, measured across the dimming range. The results are overlaid with the low-risk (yellow) and no observable effect (green) levels as defined in IEEE P1789.



Driver and LED Protections

LED Driver Protections

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 Protections

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

Isolation

	Line Input	LED Output	AUX Output	Control	LEDcode	Enclosure
Line input	-	4250VDC	4250VDC	4250VDC	4250VDC	2400VDC
LED output	4250VDC	-	none	2642VDC	none	700VDC
AUX output	4250VDC	none	-	none	none	700VDC
Control	4250VDC	2642VDC	none	-	2642VDC	2642VDC
LEDcode	4250VDC	none	none	2642VDC	-	700VDC
Enclosure	2400VDC	700VDC	700VDC	2642VDC	700VDC	-

ECOdrive 12W/S Small Form Factor - Technical Specifications

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 data sheet. 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.

Warranty

eldoLED Products are covered by a 5-year limited warranty.

Complete warranty terms can be found at: www.eldoled.com/legal/terms-and-conditions

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Specifications subject to change without notice. Actual performance may differ as a result of end-user environment and application.