

Philips Lumiblade OLED driver, low voltage D024V 10W/0.1-0.4A/28V D/A



Enabling future proof OLED technology.

This driver detects the power and voltage needs of the attached OLED and drives the attached OLED Panel accordingly. This one-driver-fits-all-panels approach eases the life of the customers and makes this driver also compatible for future developments.

Benefits

- 0-10V or DALI controller dimming down to 1%.
- A protection circuit for the OLED is implemented
- Compact housing enables new design possibilities
- Cascading multiple drivers reduces the costs for the transformers

Product Features

- Small dimensions
- Operating window from 100 to 400 mA, adjustable by OLED resistor or software programmable
- DALI and 0-10 Volt control interface in one driver
- 24 Volt DC input

Applications

Office lighting and integrated lighting solutions (e.g. furniture)

Electrical input data

Specification item	Value	Unit	Condition
Nominal input voltage	24	Vdc	
Input voltage range	21.6 ... 26.4	Vdc	Performance range
Maximal input current	500	mA	Input voltage = 24Vdc
Maximal input power	12	W	Input voltage = 24Vdc
Efficiency	83	%	Input voltage = 24Vdc @ 0.4A 25V load
Max cascaded inputs	8	pieces	

Attention: For safety operation, the 24V input must only be connected to SELV or class 2 (according to US national electrical code) circuits.

Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant current		
Output voltage	5 ... 28	Vdc	
Output voltage max	33	Vdc	Peak voltage at open load
Output current	100 ... 400	mA	Adjusted by R_{set}
Output current tolerance	± 5	%	100% dim level
Output current ripple	30	%	Ripple = peak-peak/average
Output power	10	W	Full output

Electrical data controls input

Specification item	Value	Unit	Condition
Control Method	Dali and 0-10V dimming		
Dimming range	1 ... 100	%	
Galvanic isolation	2750Vac		

Wiring

Specification item	Value	Unit	Condition
Input wire cross-section	0.2 ... 0.75 18 ... 24	mm ² AWG	WAGO 2060-series, solid wire, 5A max.
Input wire strip length	6...7	mm	
Output connector	0532610571	Molex PicoBlade	

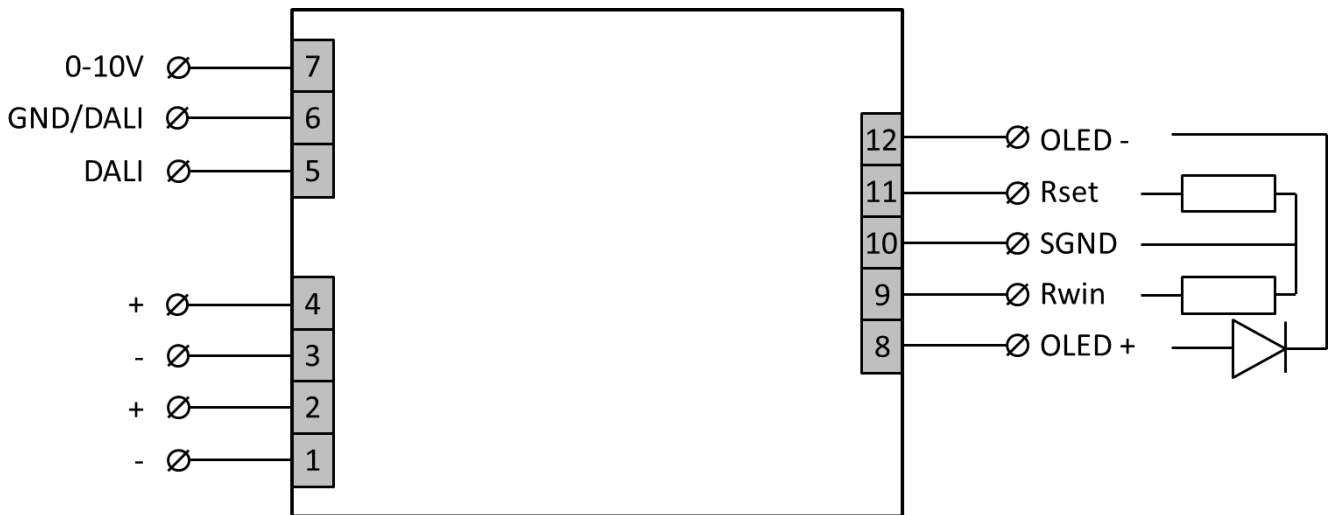
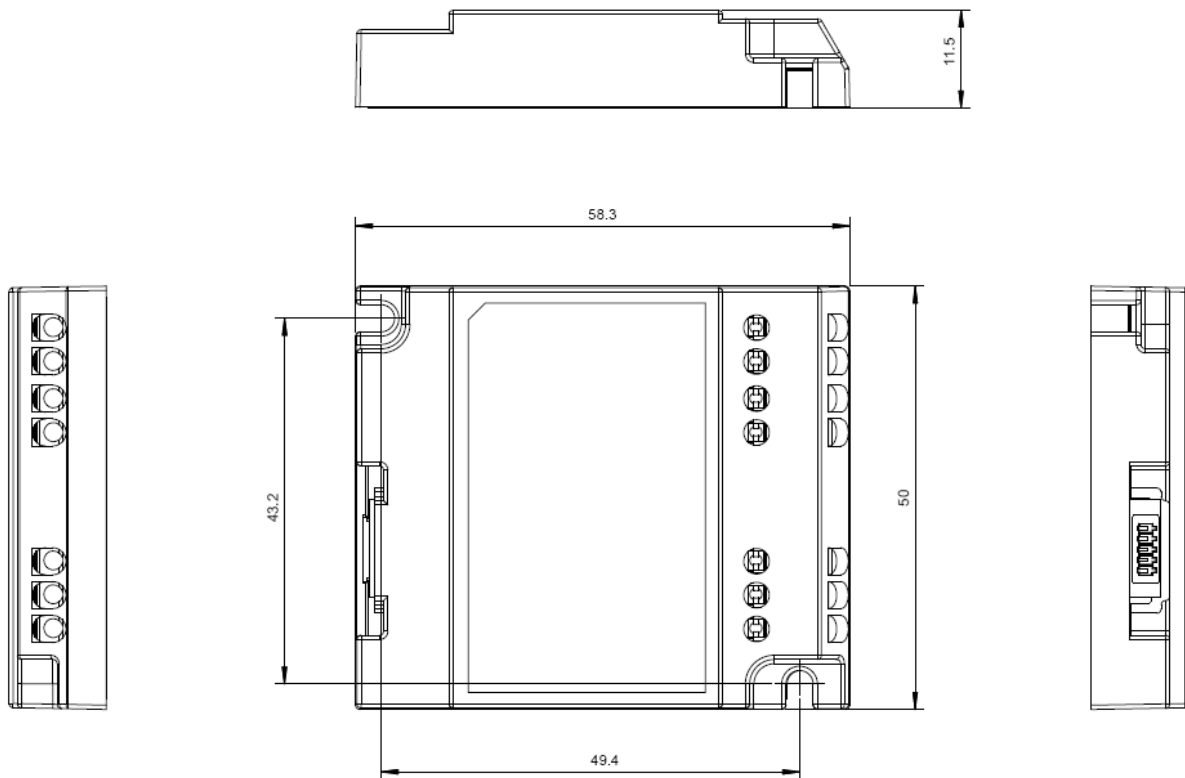


Figure 1: Port assignment of driver D024V 10W/0.1-0.4A/28V D/A

Dimensions and weight

Specification item	Value	Unit	Condition
Length	58.3	mm	
Width	50.0	mm	
Height	11.5	mm	
Fixing hole diameter	3.2	mm	Fixing with M3 screws
Fixing hole distance	65.6	mm	
Weight	25	g	



Operational temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-20 ... +50	°C	
Tcase-max	85	°C	Maximum temperature measured at Tc-point (lifetime reduced by 50%)
Tcase-life	50	°C	Measured at Tc point
Relative humidity	5 ... 85	%	Non condensing

Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-25 ... +85	°C	
Relative humidity	5 ... 95	%	Non condensing

Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	50,000	hours	Measured temperature at Tc-point is Tcase-life. Maximum failures is 10%

Features

Specification item	Value	Unit	Condition
Open load protection	Yes		Reset by DALI off or Rset/Rwin resistor plug
Short circuit protection	Yes		Reset by DALI off or Rset/Rwin resistor plug
Over power protection	Yes		Output power limit at 10W max
Hot wiring	Yes		
Suitable for fixtures with protection class	Class I, Class II and Class III		
Set output current	Rset	See functional description. Default output current: 350 mA	
Set output voltage window	Rwin	See functional description. OLED reference voltage: 9V	
Constant lumen over lifetime	No		

Certificates and standards

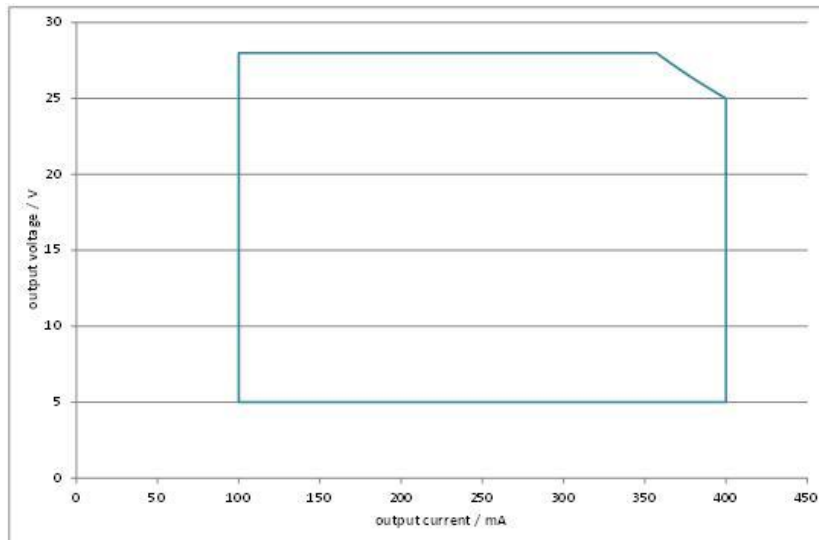
Specification item	Value	Unit	Condition
Approval marks	ENEC, CE, UL, CQC		IEC61347-2-13

			IEC62384 UL8750 GB19510.14 GB17743
Ingress Protection classification	IP20		
RoHS	Yes		2011/65/EU

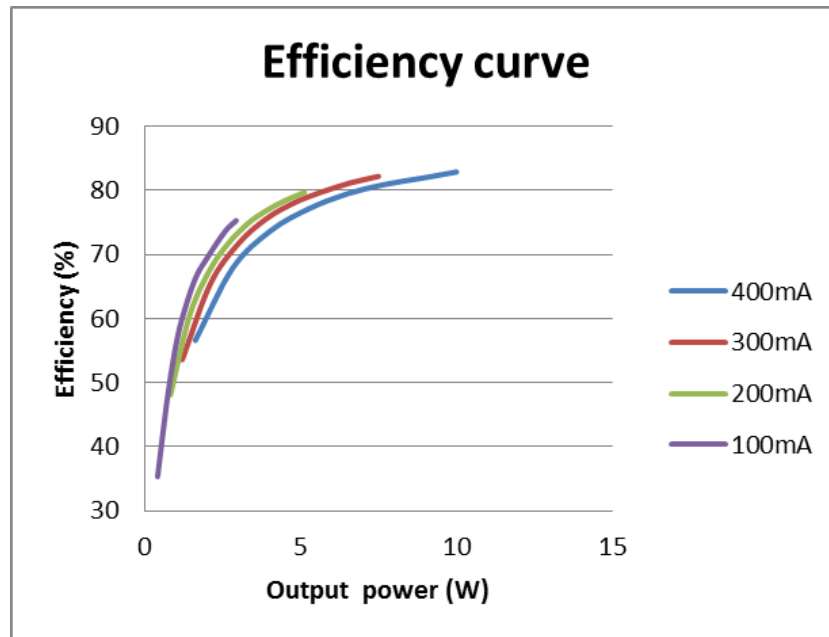
Inrush current

Specification item	Value	Unit	Condition
Inrush current I _{peak}	19	A	Input voltage 24Vdc, single driver
Inrush current T _{width}	0.023	Micro seconds	Input voltage 24Vdc, measured at 50% I _{peak}

Operating window



Efficiency versus output power



Functional Description

The driver is easy to use. It will start working after applying 24V at input. The OLED can be connected via a connector. Use Rset to set up the OLED current. The Rset resistor value is used to define the OLED current. Use value less than 100 Ohm will cause output disable. The output is limited to 400mA for high ohmic values (>910Ohm).

R _{SET} [Ω]	I _{SET} [mA]
0	100
100	100
110	105
120	111
130	116
150	125
160	130
180	138
200	146
220	155
240	166
270	176
300	190

R _{SET} [Ω]	I _{SET} [mA]
330	204
360	215
390	228
430	245
470	261
510	277
560	297
620	318
680	340
750	368
820	392
910	422

Use R_{win} to set up the OLED protection voltage level. The R_{win} resistor value is used to set the short trigger level and the end of lifetime (EOL) trigger level and.

Number of stack	R_{win} [Ω]	$V_{OLED,ref}$ [V]	V_{short} [V]	V_{EOL} [V]
1	200	3	2	9
2	400	6	4	15
3	600	9	6	21
4	800	12	8	27
5	1000	15	10	33
6	1200	18	12	39
7	1400	21	14	45
8	1600	24	16	51
9	1800	27	18	57

Application setup

The driver allows three different operation modes:

Stand-alone (no dimming)

In this mode, the driver can be switched on/off by the 24V DC power supply. No further control connection is necessary.

Dimmable control via 0-10V

In this mode, a 0-10V control gear or an 100k Ω potentiometer is connected to the 0-10V control input. The control input is suitable for Class 1 or Class 2 control gears. The driver can be switched on/off by the 24V DC power supply or by a control voltage below 0.5V. The output current can be set by a control voltage between 1V (min.) and 10V (max.)

A typical installation is shown in figure 2.

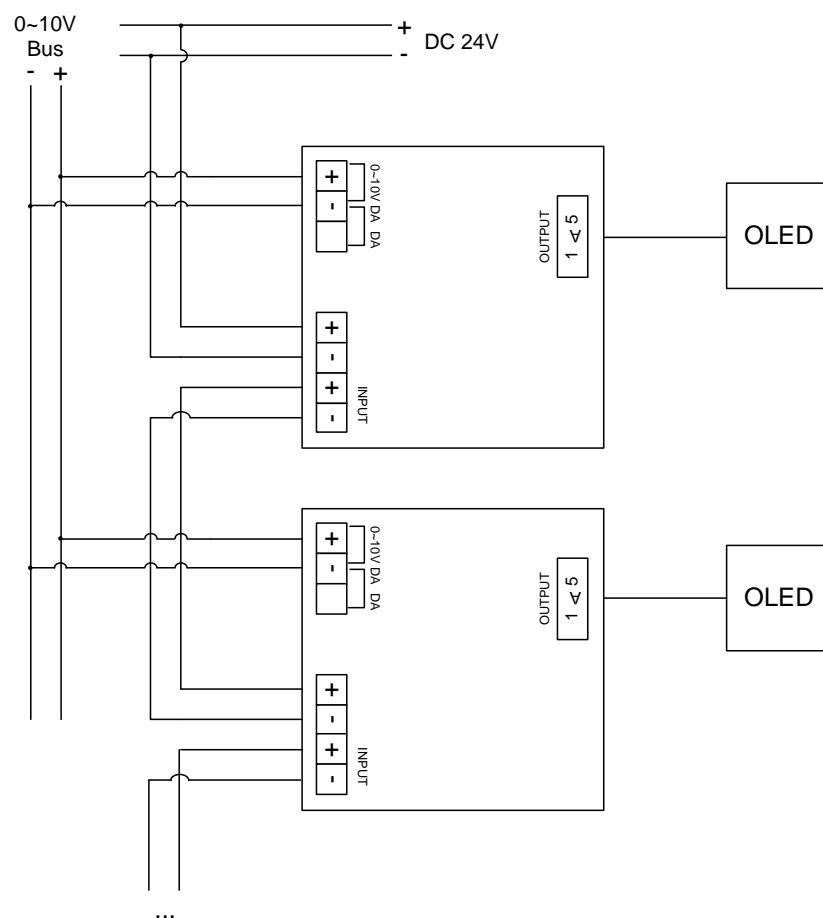


Figure 2: Typical 0-10V installation

Dimmable control via DALI

In this mode, a DALI control gear is connected to the DALI control input. The control input is suitable for Class 1 or Class 2 control gears.

The driver can be switched on/off by the 24V DC power supply or via DALI. The output current can be set different DALI dimming levels.

A typical installation is shown in figure 3.

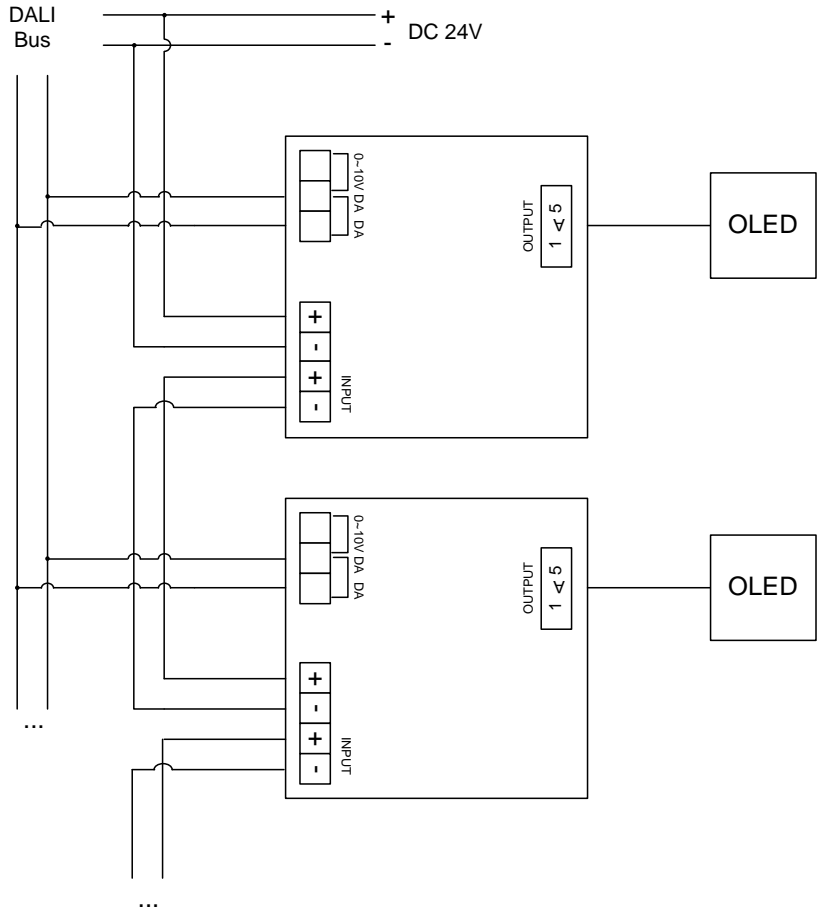


Figure 3: Typical DALI installation

Dimming control with 0~10V

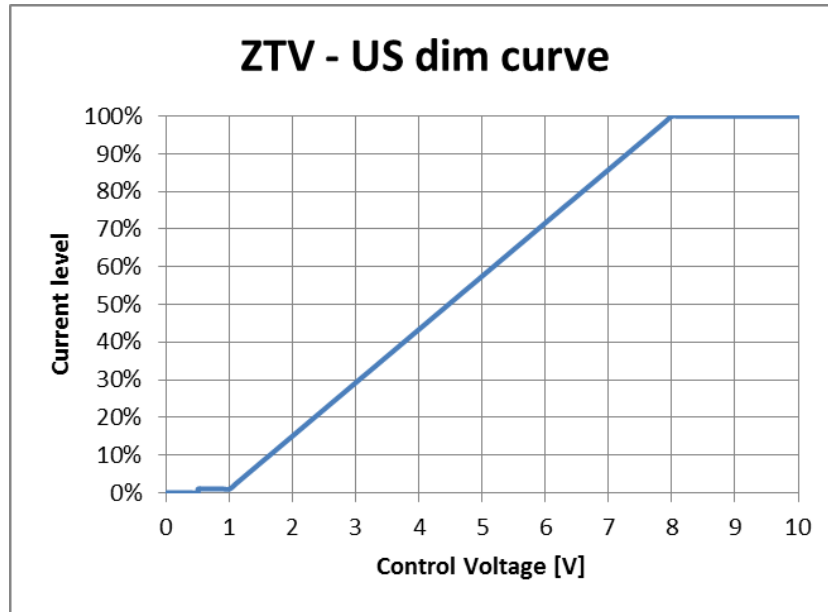


Figure 4: Dimming curve for 0-10V dimming

Dimming control with DALI

DALI interface has a higher priority over 0-10V control interface. If both control interfaces are connected, the output is set by the DALI interface.

Two dimming curves are implemented which can be selected via DALI command:

I. Logarithmic dim curve (preset, acc. IEC62386-102)

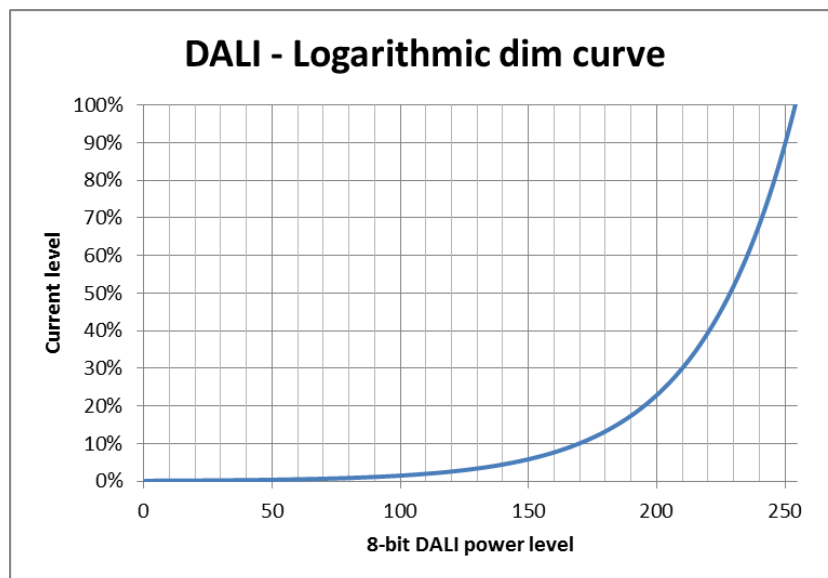


Figure 5: Logarithmic DALI dim curve

2. Linear dim curve

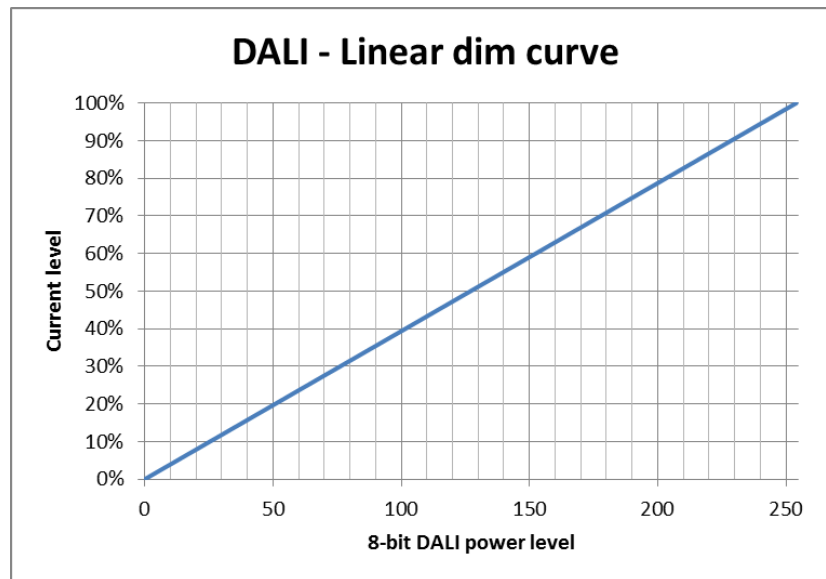


Figure 6: Linear DALI dim curve

Application Information

Programmable

OLED current and operating voltage window can be programmed by DALI interface by Philips MultiOne (9137 003 46703).

Driver requirements

For safety operation, the 24V input must only be connected to SELV or class 2 (according to US national electrical code) circuits. The control input circuit can be class 1 or class 2 circuit.

It is necessary to switch of the 24V power supply before connect/disconnect any driver to the 24V line.

Power Supply Units

The following AC-to-DC converters are suggested be used as 24V power supply:

Manufacturer	Product name
Philips	LED Power Driver 20W – 24V (9317 006 208)
Philips	LED Power Driver 60W – 24V (9317 006 209)
Philips	LED Power Driver 80W – 24V (9290 006 539)

Logistical data

Specification item	Value
Product name	Lumiblade D024V I0W/0.1-0.4A/28V D/A
Order code	872790037919840
Logistics code I2nc	9254 000 10101
EAN3	8727900379204
Pieces per box	20

Standards, compliance and sustainability

Philips Lumiblade products are environmentally friendly by avoiding the use of hazardous materials and by providing efficient illumination. These products are RoHS (EU directive 2011/65/EU) compliant.



Contact:

Philips GmbH
Business Center OLED Lighting
Philipsstr. 8, 52068 Aachen, Germany
info@lumiblade-experience.com

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