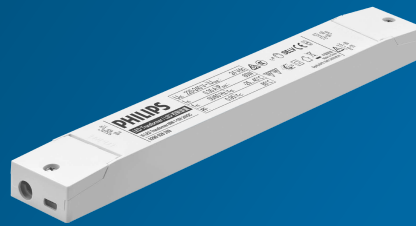


# PHILIPS

LED Transformers

Datasheet



## LED Transformers

### Xi LED Transformer 60W 1-10V 24VDC

#### Product description

Philips fully-electronic constant voltage 1-10V LED Transformers are designed to operate dimmable 24VDC LED solutions used for linear accent lighting in general applications such as hotel rooms, restaurants and retail displays. These state-of-the-art drivers offer controllability via the 1-10V protocol. They are specifically designed to ensure the highest performance with maximum robustness combined with a long lifetime

#### Benefits

- SELV operating voltages, ensuring safety even if wiring or LED boards become damaged
- Energy savings through high efficiency
- Ultimate robustness, offering peace of mind and lower maintenance costs
- Easy to design-in and install
- Extremely slim design, enabling integration in narrow cabinets
- Long lifetime

#### Features

- 1-10V control interface incl. dim to OFF
- Independent use for Insulation Class I and Class II applications
- Global approbations and certifications
- Stable output voltage
- Wide ambient temperature range
- Protection against overpower and overvoltage
- Output short-circuit shutdown feature with automatic restart

#### Applications

- Retail display lighting, linear accent lighting and refrigerated display lighting
- Shelf lighting
  - Cove lighting
  - Facade accent lighting
  - Coolers and freezers

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	220 ... 240	Vac	Performance
Rated input voltage range	198 ... 264	Vac	Operational safety
Rated input frequency	50 ... 60	Hz	Performance
Rated input frequency	45 ... 66	Hz	Operational safety
Rated input current	0.30	A	230Vac, @ rated output power
Rated input power	68.2	W	230Vac, @ rated output power
Power factor	0.99		230Vac, @ rated output power.
Total harmonic distortion	6	%	230Vac, @ rated output power.
Efficiency (typ)	88	%	230Vac, @ rated output power.

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Voltage		Rated output voltage = 24VDC
Output voltage range	22.8 ... 25.2	Vdc	@ output current range 1.25 ... 2.5A
Output current range	0 ... 2.5	Adc	
Output voltage ripple	< 240	mV <sub>pp</sub>	
Rated output power	60	W	
Line regulation	< 1	%	
Load regulation	< 2	%	
Turn-on delay	< 0.5	s	With Fortimo LEDFlex 24VDC Strip
Output voltage rise time	≤ 50	ms	
Hold-up time	≥ 10	ms	

## Electrical data controls input

Specification item	Value	Unit	Condition
Control method	1-10V (0-10V) dimming		0-10V, source current 0.1mA typical
	PWM dimming		PWM Signal dimming Duty: 0 ... 99%. 0.25 ... 2kHz Voltage amplitude: 3 ... 10V
	Resistance dimming		0-100/N kilo-Ohm, N=driver quantity for synchronized dimming operation
Dimming range	1 ... 100	%	Based on PWM, f = 1.38kHz, incl. Dim-to-off. <b>Note:</b> minimum output loading at full light output must be at least 30W to ensure stable dimming down to 1%. Please refer to design-in guide for more controllability details.

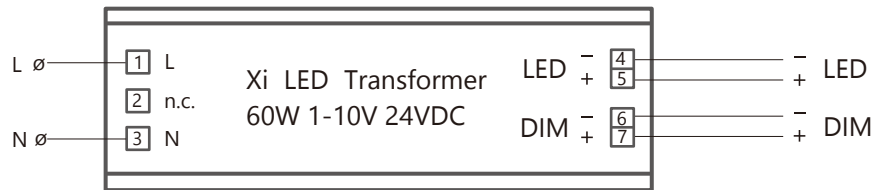
## Logistical data

Specification item	Value
Product name	Xi LED Transformer 60W 1-10V 24VDC
EOC	692234191771400
Logistic code 12NC	9290 028 25980
Pieces per box	20

## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.75 ... 1.5 / 18 ... 16	mm <sup>2</sup> / AWG	Screw connection, solid and stranded wire
Input cable diameter	3.3 ... 8.0	mm	
Input wire strip length	6 ... 7	mm	
Output wire cross-section *	0.75 ... 1.5 / 18 ... 16	mm <sup>2</sup> / AWG	Screw connection, solid and stranded wire
Output cable diameter	3.3 ... 8.0	mm	
Output wire strip length	6 ... 7	mm	
Control wire cross-section	0.5 ... 1.5 / 20 ... 16	mm <sup>2</sup> / AWG	Screw connection, solid and stranded wire
Control cable diameter	2.5 ... 8.0	mm	
Control wire strip length	6 ... 7	mm	
Strain relief screw max. torque	0.5	Nm	
Connector screw max. torque	0.5	Nm	
Maximum output cable length	1.0	m	CISPR15: between driver and LED module

\*: Shown values apply to independent application. Minimum wire cross section = 0.75mm<sup>2</sup> / 18AWG for output current > 2A

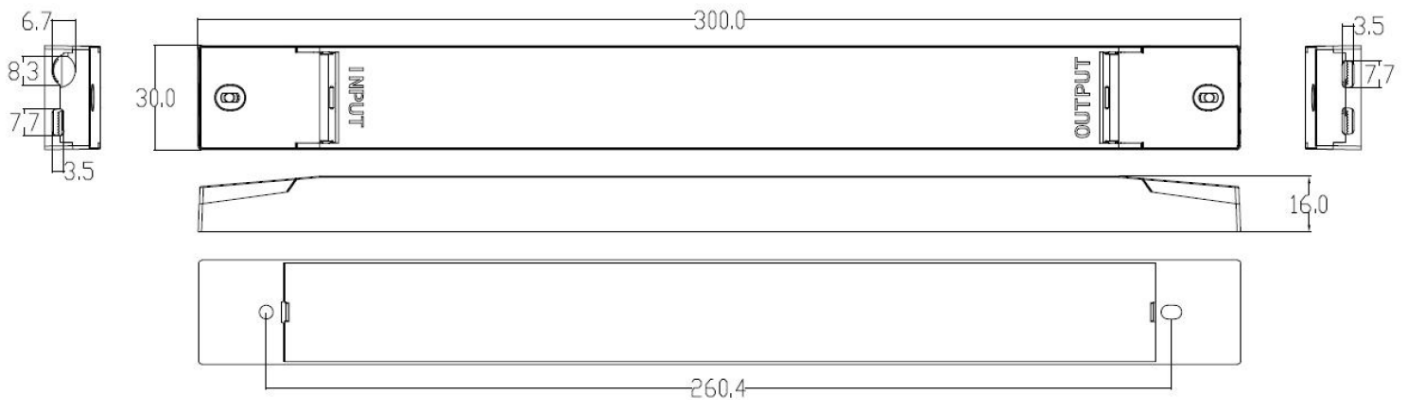


## Insulation

Insulation (acc. IEC61347-1)	Mains	LED	1-10V
<b>Mains</b>		SELV (double)	Basic
<b>LED</b>	SELV (double)		Double
<b>1-10V</b>	Basic	Double	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	300	mm	
Width (B1)	30	mm	
Height (C1)	16	mm	
Fixing hole distance (A2)	260.4	mm	Fixing hole diameter (D): 4.1mm
Weight	200	gram	



## Operational temperatures and humidity

Specification item	Value	Unit	Condition
Driver ambient temperature	-25 ... +45	°C	At rated output power. Higher ambient temperature allowed as long as Tcase-max is not exceeded.
Tcase-min	-25	°C	
Tcase-max	+80	°C	Max. steady-state Tcase
Tcase-life	+70	°C	For rated driver lifetime
Maximum housing temperature	130	°C	In case of failure, inherent by design
Relative humidity	10 ... 90	%	Non-condensing
Ingress Protection *	IP20		
Noise and hum	≤ 20	dB(A)	

\*: The LED Transformer is primarily intended for independent use. It must not be exposed including but not limited to snow, water and ice or any other chemical agent which may have an adverse affect on driver operation and performance. Exposure may lead to driver failure. It is the luminaire manufacturer's / installer's responsibility to prevent exposure.

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-25 ... +80	°C	
Relative humidity	5 ... 95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Rated driver lifetime	50,000	hours	$T_{case} \leq T_{case-life}$ . Maximum failures = 10%. See graph.

## Features

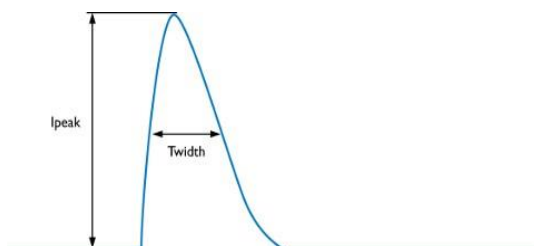
Specification item	Value	Remark	Condition
Open load protection	Yes		$U_{out}$ (open circuit) = 26V max.
Short-circuit protection	Yes		Hiccup mode, automatic recovering
Overpower protection	Yes		Automatic recovering
Overheating protection	No		
Hot wiring	Yes		
Suitable insulation class applications	I / II		Per IEC60598

## Certificates and standards

Specification item	Value
Approval marks	CE / ENEC / F / 110 / Double-insulated / Independent / SELV / MM / CCC / RCM

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$ (typ)	7	A	Input voltage 240Vac
Inrush current $T_{width}$ (typ)	600	$\mu$ s	Input voltage 240Vac, measured at 50% $I_{peak}$
Max. recommended number of drivers	29	pcs	MCB 16A B type, mains impedance 200m $\Omega$ + 400 $\mu$ H



MCB	Rating	
B	6A	37%
B	10A	63%
B	13A	81%
B	16A	<b>100%</b>
B	20A	125%
B	25A	156%
C	6A	63%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%
D	6A	130%
D	10A	210%
D	13A	280%
D	16A	350%
D	20A	470%
D	25A	550%

\* : please check that cable cross sectional area corresponds with MCB rating and type

## Touch current/protective conductor current

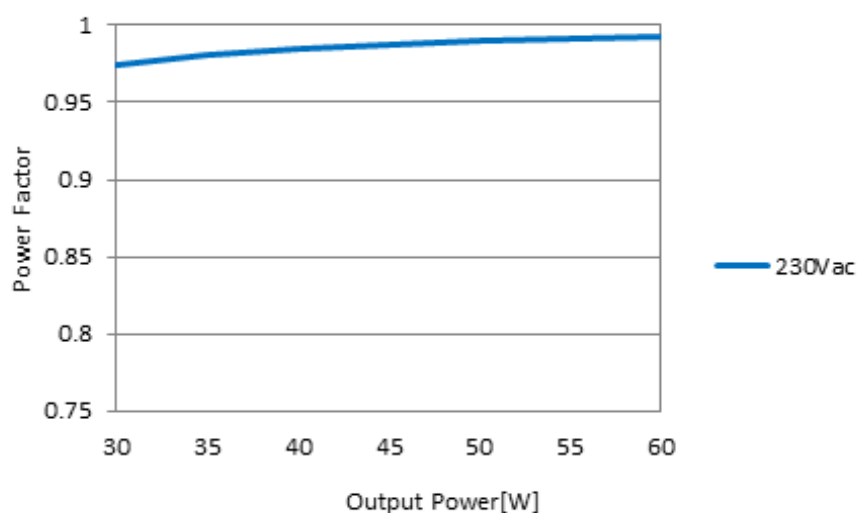
Specification item	Value	Unit	Condition
Touch / protective conductor current	< 0.7 / 0.5	$mA_{peak} / mA_{rms}$	Acc. IEC61347-1 at 240V/60Hz LED module contribution not included

## Surge immunity

Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	2/ 1	kV / kA	L-N, acc. IEC61000-4-5, 2 Ohm, 1.2/50 $\mu$ s, 8/20 $\mu$ s
Mains surge immunity (comm. mode)	2	kV	L/N-PE/GND, acc. IEC61000-4-5, 12 Ohm, 1.2/50 $\mu$ s, 8/20 $\mu$ s
1-10V control surge immunity (diff. mode)	1 / 0.5	kV / kA	1-10V +/-, acc. IEC61000-4-5, 2 Ohm, 1.2/50 $\mu$ s, 8/20 $\mu$ s

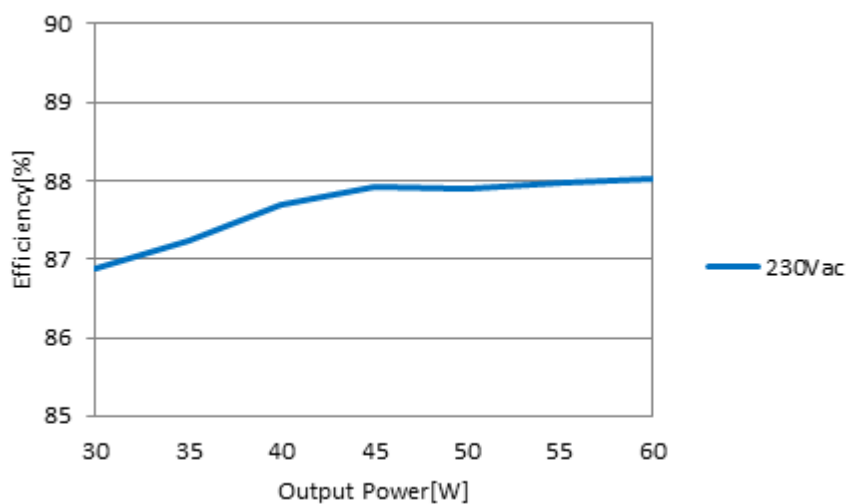
### Power factor versus output power

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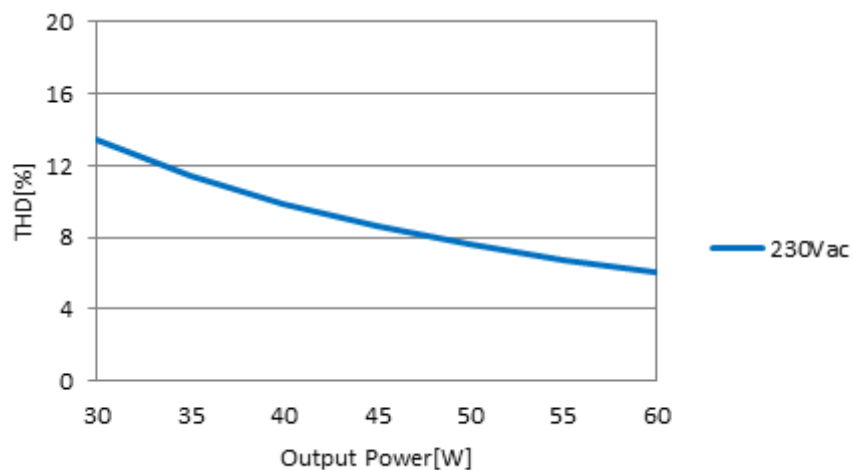
### Driver efficiency versus output power

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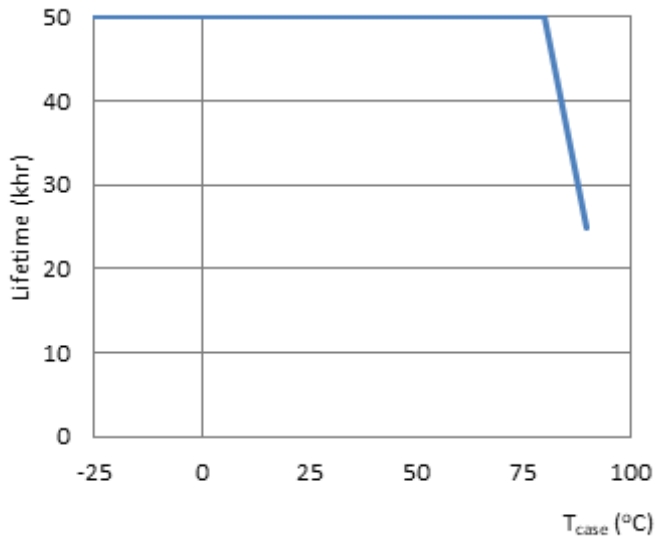


### Input current THD versus output power

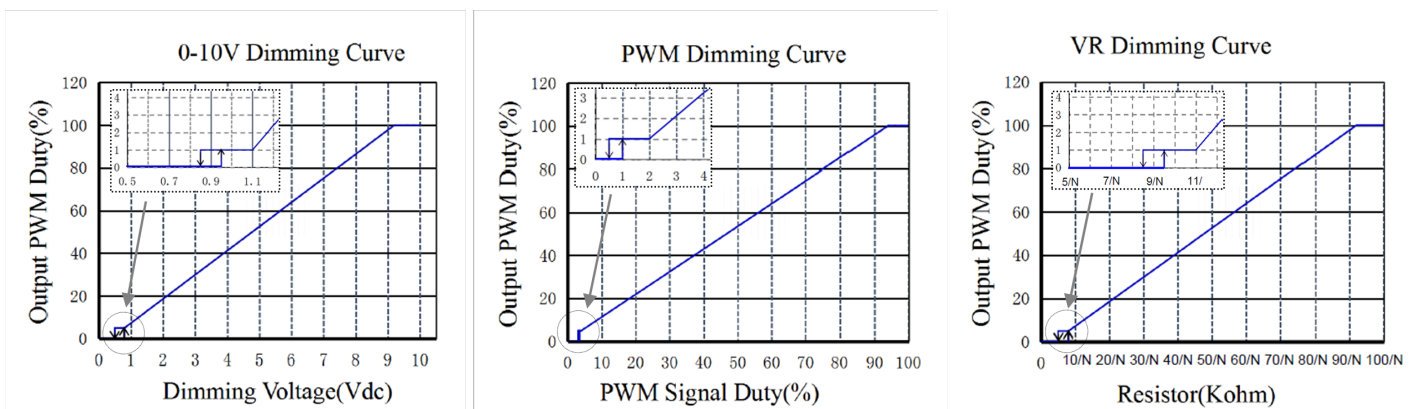
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## Driver lifetime versus Tc temperature



## Driver output versus dimming voltage



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