EM powerLED CPS FX 80 W

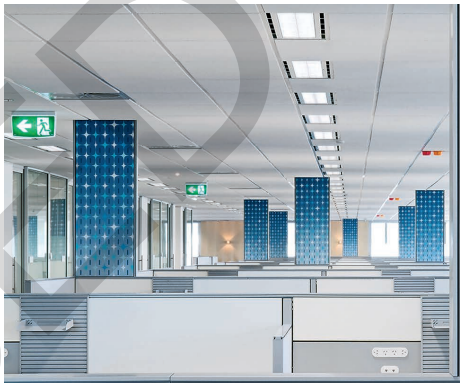
LED Driver for AC and DC power supplies

Product description

- Fixed-output LED Driver for mains operation with integrated Simple CORRIDOR FUNCTION (CF)
- Emergency lighting function for use in central battery systems
- For LED modules with a forward voltage of 50 – 230 V
- For luminaire installation
- Low-profile casing (21 x 30 mm cross-section)
- 5 years guarantee

Properties

- 25 – 80 W output power
- Constant current LED operation
- 150 – 500 mA output current selectable with I-SELECT PLUG in steps of 25 mA
- Simple CORRIDOR FUNCTION (CF) with 10 % light level
- Light output in DC operation (EoF): 0.1 or 1
- Automatic shutdown of output if LED load is out of range
- For emergency lighting systems as per EN 50172



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EM powerLED CPS FX 80 W

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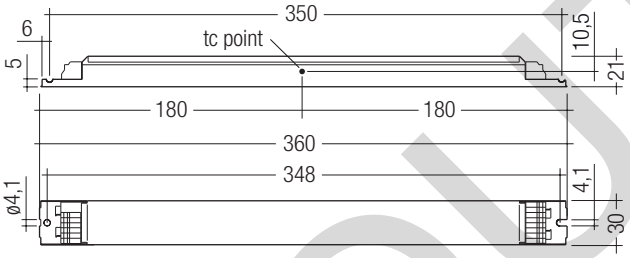
Technical data

Rated supply voltage	220 – 240 V
Voltage range AC	198 – 264 V
Voltage range DC	176 – 280 V
Mains frequency	0 / 50 / 60 Hz
Typ. λ (at 230 V, 50 Hz, normal operation)	0.97
Typ. λ (at 230 V, 50 Hz, CF operation)	0.65c
Leakage current (PE)	< 0.5 mA
Overvoltage protection	320 V (for 1 h)
Max. open circuit voltage	250 V
Time to light	< 0.5 s
Output LF current ripple (< 120 Hz)	< 2 %
Output current tolerance	± 7 %
THD normal operation	< 10 %
THD CF operation	< 25 %
Ambient temperature ta ≤ 65 W	-5 … +55 °C
Ambient temperature ta > 65 W	-5 … +50 °C
Max. casing temperature tc	80 °C
Dimensions LxWxH	360 x 30 x 21 mm
Type of protection	IP20



Note: I-SELECT PLUG must be set before mains connection.

Ordering data

Type[3]	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
EM powerLED CPS FX LP 80W	**89800435**	10 pc(s).	600 pc(s).	0.253 kg

Specific technical data

Type[3]	Output current	Min. output voltage[2]	Max. output voltage[2]	Min. output power	Max. output power	Input power (230 V, 50 / 0 Hz, full load)	Input current (230 V, 50 / 0 Hz, full load)	Efficiency (230 V, 50 Hz)	λ (at 230 V, full load)		Ambient temperature ta[1]	tc/ta for ≥ 50.000 h[1]	I sel resistor value
									AC	DC			
Normal operation AC / DC (100 %)													
EM powerLED CPS FX LP 80W	150 mA	168 V	230 V	25 W	34.5 W	40 W	200 / 170 mA	86 %	0.85c	1	-5 … +55 °C	78 / 55 °C	open
	175 mA	142 V	230 V	25 W	40.3 W	45 W	220 / 190 mA	90 %	0.90c	1	-5 … +55 °C	78 / 55 °C	64.90 kΩ
	200 mA	126 V	230 V	25 W	46.0 W	50 W	250 / 220 mA	92 %	0.90c	1	-5 … +55 °C	78 / 55 °C	56.00 kΩ
	225 mA	111 V	230 V	25 W	51.8 W	56 W	270 / 240 mA	93 %	0.90c	1	-5 … +55 °C	78 / 55 °C	48.70 kΩ
	250 mA	100 V	230 V	25 W	57.5 W	62 W	300 / 270 mA	93 %	0.95	1	-5 … +55 °C	78 / 55 °C	43.20 kΩ
	275 mA	90 V	230 V	25 W	63.3 W	68 W	320 / 300 mA	93 %	0.95	1	-5 … +50 °C	78 / 50 °C	36.50 kΩ
	300 mA	83 V	230 V	25 W	69.0 W	74 W	350 / 320 mA	93 %	0.97	1	-5 … +50 °C	78 / 50 °C	32.40 kΩ
	325 mA	76 V	230 V	25 W	74.8 W	80 W	370 / 350 mA	94 %	0.97	1	-5 … +50 °C	78 / 50 °C	28.70 kΩ
	350 mA	70 V	228 V	25 W	80.0 W	87 W	400 / 375 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	22.00 kΩ
	375 mA	67 V	213 V	25 W	80.0 W	87 W	400 / 380 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	17.80 kΩ
	400 mA	62 V	200 V	25 W	80.0 W	87 W	400 / 380 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	15.00 kΩ
	425 mA	59 V	188 V	25 W	80.0 W	87 W	400 / 380 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	12.10 kΩ
	450 mA	56 V	177 V	25 W	80.0 W	87 W	400 / 380 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	9.30 kΩ
	475 mA	51 V	169 V	25 W	80.0 W	87 W	400 / 380 mA	92 %	0.97	1	-5 … +50 °C	78 / 50 °C	6.49 kΩ
	500 mA	50 V	160 V	25 W	80.0 W	90 W	400 / 380 mA	89 %	0.97	1	-5 … +50 °C	78 / 50 °C	short circuit (0 Ω)
CF operation AC / DC (10 %)													
EM powerLED CPS FX LP 80W	14 mA	–	–	2.4 W	3 W	5.0 W	75 / 20 mA	60 %	0.30c	1	–	–	open
	17 mA	–	–	2.4 W	4 W	6.0 W	75 / 25 mA	67 %	0.35c	1	–	–	64.90 kΩ
	19 mA	–	–	2.4 W	4 W	6.0 W	75 / 25 mA	67 %	0.35c	1	–	–	56.00 kΩ
	23 mA	–	–	2.6 W	5 W	7.0 W	80 / 30 mA	71 %	0.40c	1	–	–	48.70 kΩ
	23 mA	–	–	2.3 W	5 W	7.0 W	80 / 30 mA	71 %	0.40c	1	–	–	43.20 kΩ
	28 mA	–	–	2.5 W	6 W	8.0 W	80 / 35 mA	75 %	0.45c	1	–	–	36.50 kΩ
	28 mA	–	–	2.3 W	6 W	8.0 W	80 / 35 mA	75 %	0.45c	1	–	–	32.40 kΩ
	32 mA	–	–	2.4 W	7 W	9.0 W	85 / 40 mA	78 %	0.45c	1	–	–	28.70 kΩ
	32 mA	–	–	2.2 W	7 W	9.0 W	85 / 40 mA	78 %	0.45c	1	–	–	22.00 kΩ
	36 mA	–	–	2.4 W	7 W	9.5 W	85 / 40 mA	74 %	0.50c	1	–	–	17.80 kΩ
	42 mA	–	–	2.6 W	7 W	10.0 W	85 / 45 mA	70 %	0.50c	1	–	–	15.00 kΩ
	42 mA	–	–	2.5 W	7 W	10.0 W	85 / 45 mA	70 %	0.50c	1	–	–	12.10 kΩ
	45 mA	–	–	2.5 W	7 W	10.0 W	85 / 45 mA	70 %	0.50c	1	–	–	9.30 kΩ
	46 mA	–	–	2.3 W	7 W	10.0 W	85 / 45 mA	70 %	0.50c	1	–	–	6.49 kΩ
	50 mA	–	–	2.5 W	7 W	10.0 W	85 / 45 mA	70 %	0.50c	1	–	–	short circuit (0 Ω)

[1] Ambient temperature range ta defined in normal operation

[2] Output voltage range defined in normal operation. LED forward voltage will decrease in CF operation.

[3] EM = Emergency

RoHS

ACCES-SORIES

smartSWITCH HF 5DP f

Automatic switching based on motion and light level

Product description

- Motion detector for luminaire installation
- Motion detection through glass and thin materials (except metal)
- For automatic on/off switching of electronic ballasts
- Bright-out function: luminaire is not switched on if there is adequate brightness
- Delay time, detection range and light value for the bright-out function can be set via 9 dip switches
- Max. installation height 5 m
- Two housing options allowing flexible installation
- Variable detection area (100 – 10 %)
- Zero cross switching supported
- 5-year guarantee

smartSWITCH HF 5DP f

smartSWITCH HF 5DP S f

Ordering data

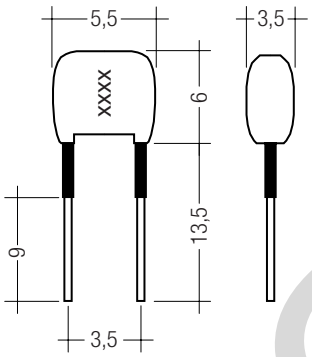
Type	Article number	Dimensions L x W x H	Packaging, carton	Weight per pc.
smartSWITCH HF 5DP f	**28002214**	70 x 36.5 x 24.5 mm	5 pc(s).	0.040 kg
smartSWITCH HF 5DP S f	**28002235**	58 x 48.5 x 24.5 mm	5 pc(s).	0.040 kg

ACCES-SORIES

I-SELECT PLUG

Product description

- Ready-for-use resistor to set output current value
- Resistor is base isolated
- Resistor power 0.25 W
- Resistor value tolerance ± 1 %



Ordering data

Type	Article number	Colour	Marking	Resistor value	Output current	Packaging bag	Weight per pc.
I-SELECT PLUG E	**28000628**	Green	64k9	64,90 kΩ	175 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000627**	Green	56k	56,00 kΩ	200 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000626**	Green	48k7	48,70 kΩ	225 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000625**	Green	43k2	43,20 kΩ	250 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000624**	Green	36k5	36,50 kΩ	275 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000623**	Green	32k4	32,40 kΩ	300 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000622**	Green	28k7	28,70 kΩ	325 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000621**	Green	22k	22,00 kΩ	350 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000620**	Green	17k8	17,80 kΩ	375 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000619**	Green	15k	15,00 kΩ	400 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000618**	Green	12k1	12,10 kΩ	425 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000617**	Green	9k3	9,30 kΩ	450 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000616**	Green	6k49	6,49 kΩ	475 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	**28000612**	Green	0R	0,00 kΩ	500 mA	10 pc(s).	0.001 kg

Standards
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61347-2-13
- EN 61547
- EN 62384
- according to EN 50172
- according to EN 60598-2-22

Output current setting
Output current can be set by connecting a resistor between the 2 "I set" terminals. Relationship between output current and resistor value can be found at the table "Specific technical data". Resistor values specified from standardised resistor value ranges.
Resistor value tolerance has to be ≤ 1 %.
Resistor power has to be ≥ 0.1 W.
Resistor detection at each start.
Change of the resistor value during the operation will be not considered.
Resistors for the main output current values can be ordered from Tridonic (see accessories).

Note: The I SET terminals are rated as Non-SELV

Overload protection
LED Driver will switch off at overload operation. Mains reset is required to restart the LED Driver.

Underload operation
LED Driver will switch off at underload operation. Mains reset is required to restart the LED Driver.

Short-circuit behaviour
In case of a short circuit the unit switches to shut down mode. After elimination of the short circuit a mains reset is necessary.

Forward voltage out of range
If the forward voltage is out of range the unit switches to shut down mode. After elimination of the short circuit a mains reset is necessary.

No-load operation or load loss during operation
LED Driver will detect a load loss during operation. In this case and no-load operation the max. output voltage can apply at the LED output for max. 5 s before LED Driver shuts down. Mains reset is required to restart the LED Driver.

Isolation and electric strength testing of luminaires
Electronic LED Drivers can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 VDC for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal. The isolation resistance must be at least 2 MΩ.

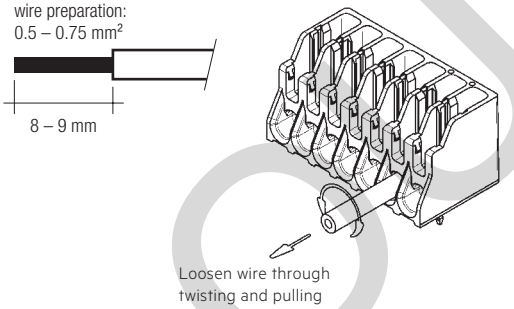
As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1,500 VAC (or 1,414 x 1,500 VDC). To avoid damage to the electronic devices this test **must not be conducted**.

Mechanichal details
Channel manufactured from galvanised steel.
Cover manufactured from white pre-coated steel.

Electrical connections

Wiring

LED module/LED Driver/supply



IDC interface
- solid wire with a cross section of 0.5 mm²
  according to the specification from IDC terminals

Earth connection

The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via earth terminal or metal housing. If the LED Driver will be earthed, protection earth (PE) has to be used. There is no earth connection required for the functionality of the LED Driver.
Earth connection is recommended to improve following behaviour.

- Electromagnetic interferences (EMI)
- LED glowing at standby
- Transmission of mains transients to the LED output

In general it is recommended to earth the LED Driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

Wiring type and cross section
Solid wire with a cross section of 0.5 – 0.75 mm². Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.

Installation instruction
Max. torque for the mounting screws: 0.5 Nm / M4.

You must make sure that the LED is connected with the correct polarity. LEDs that are connected to EM powerLED should have polarity reversal protection such as a Schottky diode. There may be irreversible damage if the LED is connected with the wrong polarity. The protection device must be capable of handling a load of more than 700 mA.

Life-time
Average life-time 50,000 hours under rated conditions with a failure rate of less than 10 %. Average failure rate of 0.2 % per 1000 operating hours.

Maximum total lead length
LED 3 m

Storage conditions
Humidity: 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Storage temperature: -40 °C up to max. +80 °C

The devices have to be within the specified temperature range (ta) before they are operated.

Expected life-time

Type	Output power	**ta**	**40 °C**	**50 °C**	**55 °C**
EM powerLED CPS FX LP 80W	25 W	tc	57 °C	60 °C	72 °C
		life-time	> 100,000 h	> 100,000 h	85,000 h
	45 W	tc	61 °C	71 °C	71 °C
		life-time	> 100,000 h	75,000 h	55,000 h
	65 W	tc	63 °C	70 °C	73 °C
		life-time	> 100,000 h	70,000 h	70,000 h
	80 W	tc	67 °C	70 °C	x
		life-time	> 100,000 h	50,000 h	x

x = not permitted

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm^2	1.5 mm^2	2.5 mm^2	2.5 mm^2	1.5 mm^2	1.5 mm^2	2.5 mm^2	2.5 mm^2	I_{max}	time
EM powerLED CPS FX LP 80W	12	18	24	28	6	9	12	14	32.6 A	260 µs

Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

Type	THD	3	5	7
EM powerLED CPS FX LP 80W	10 %	8 %	3 %	3 %

Switching behaviour

L	**CF**	**LED**
off	off	off
off	on	off
on	off	10 %
on	on	100 %

The mains power must be removed before changing the LED load.

Secondary switching of LEDs is not allowed and may cause damage to the LEDs. The hot plug-in of LEDs during normal operation may result in high current peaks.

DC operation behaviour:
The emergency level EoF_i (0.1 or 1) depends on the polarity of the DC voltage.

Polarity of the DC voltage		
L	+	–
N	–	+
CF	+	–
Emergency level EoF_i	1	0.1

The sensor is not activ in DC operation.

Wiring guidelines

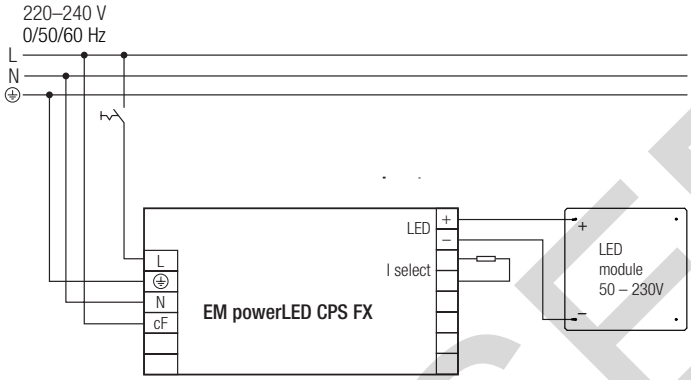
- The output to the LED is DC but has high frequency content, which should be considered for good EMC compliance.
- LED leads should be separated from the mains connections and wiring for good EMC performance.
- Maximum total lead length on the LED terminals is 3 m. For a good EMC performance keep the LED wiring as short as possible.
- To avoid the damage of the control gear, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

Within the luminaire the switched and unswitched 50 Hz supply wiring must be routed as short as possible and be kept as far away as possible from the LED leads.Through wiring may affect the emc performance of the luminaire.

The length of LED leads must not be exceeded.

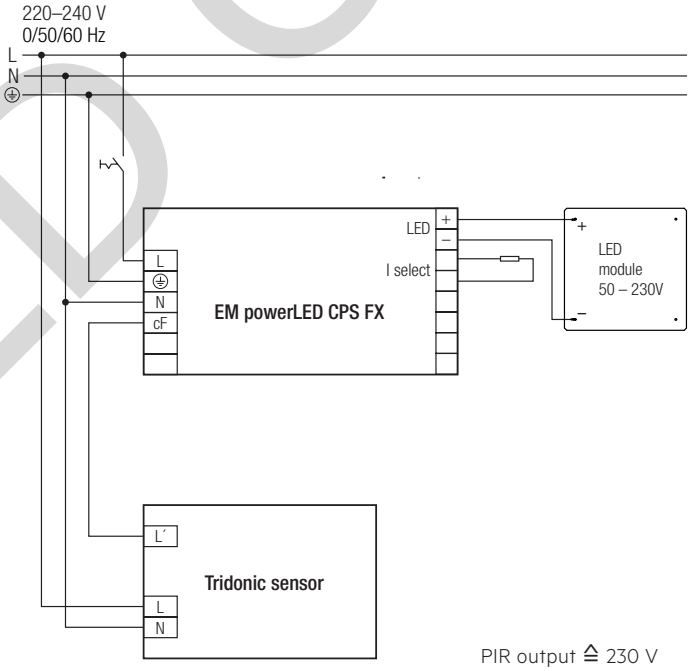
The output current depends on the forward voltage and the tolerance of the LED modules.

Wiring diagram EM powerLED CPS FX without sensor



The connected LED module will be used for mains and emergency operation.

Wiring diagram EM powerLED CPS FX with sensor



PIR output ≙ 230 V

Note

The EM powerLED CPS FX LP 80W uses pulse width modulation (PWM) for the LED operation in CORRIDOR mode. This can have an adverse effect on video recording equipment e.g. cctv.
Caution should be observed when using the CORRIDOR FUNCTION in cctv monitored areas.
This applies also to the reduced power level (10%) when the EM powerLED CPS FX LP 80W is operated on a central battery in DC mode.

Maximum number of switching cycles

All LED Drivers are tested with 50,000 switching cycles.
The actually achieved number of switching cycles is significantly higher.

Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

Life-time declarations are informative and represent no warranty claim.
No warranty if device was opened.