



EM powerLED CPS FX SR 50 W

LED Driver for AC and DC power supplies

Product description

- Independent 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 15 – 50 V
- SELV for output voltage < 60 V DC
- Compact plastic casing (209 x 82 x 34 mm) with strain relief
- 5 years guarantee

Properties

- 4.9 – 50 W output power
- Constant current LED operation
- 300 – 1,400 mA output current selectable with I-SELECT PLUG in steps of 50 mA
- Simple CORRIDOR FUNCTION (CF) with 10 % light level
- Automatic shutdown of output if LED load is out of range
- For emergency lighting systems as per EN 50172



Standards, page 6

Wiring diagrams and installation examples, page 8

SELV                                             

Specific technical data

Type [®]	Output current	Min. output voltage [®]	Max. output voltage [®]	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 / 0 Hz)	λ (230 V, full load)		Ambient temperature ta [®]	tc/ta for ≥ 50.000 h [®]	I sel resistor value
									AC	DC			
Normal operation AC / DC (100 %)													
EM powerLED CPS FX SR 50W 50V	300 mA	16.6 V	50.0 V	5.0 W	15.0 W	19 W	102 / 84 mA	79 %	0.80c	1	-5 ... 50 °C	79 / 50 °C	open
	350 mA	16.6 V	50.0 V	5.8 W	17.5 W	22 W	112 / 96 mA	80 %	0.85c	1	-5 ... 50 °C	79 / 50 °C	6980 kΩ
	400 mA	16.6 V	50.0 V	6.6 W	20.0 W	25 W	122 / 106 mA	80 %	0.87c	1	-5 ... 50 °C	79 / 50 °C	6200 kΩ
	450 mA	16.6 V	50.0 V	7.5 W	22.5 W	28 W	132 / 119 mA	80 %	0.89c	1	-5 ... 50 °C	79 / 50 °C	5600 kΩ
	500 mA	16.6 V	50.0 V	8.3 W	25.0 W	30 W	143 / 134 mA	83 %	0.91c	1	-5 ... 50 °C	79 / 50 °C	4870 kΩ
	550 mA	16.6 V	50.0 V	9.1 W	27.5 W	33 W	157 / 147 mA	83 %	0.92c	1	-5 ... 50 °C	79 / 50 °C	4320 kΩ
	600 mA	16.6 V	50.0 V	10.0 W	30.0 W	36 W	169 / 159 mA	83 %	0.92c	1	-5 ... 50 °C	79 / 50 °C	3650 kΩ
	650 mA	16.6 V	50.0 V	10.8 W	32.5 W	39 W	181 / 172 mA	83 %	0.93c	1	-5 ... 50 °C	79 / 50 °C	2870 kΩ
	700 mA	16.6 V	50.0 V	11.6 W	35.0 W	42 W	193 / 186 mA	83 %	0.94c	1	-5 ... 50 °C	79 / 50 °C	2400 kΩ
	750 mA	16.6 V	50.0 V	12.5 W	37.5 W	43 W	195 / 189 mA	87 %	0.84c	1	-5 ... 50 °C	79 / 50 °C	2050 kΩ
	800 mA	16.6 V	50.0 V	13.3 W	40.0 W	46 W	206 / 200 mA	87 %	0.85c	1	-5 ... 50 °C	79 / 50 °C	1800 kΩ
	850 mA	16.6 V	50.0 V	14.1 W	42.5 W	49 W	218 / 213 mA	87 %	0.95	1	-5 ... 40 °C	76 / 40 °C	1600 kΩ
	900 mA	16.6 V	50.0 V	14.9 W	45.0 W	52 W	234 / 230 mA	87 %	0.96	1	-5 ... 40 °C	76 / 40 °C	1330 kΩ
	950 mA	15.7 V	50.0 V	14.9 W	47.5 W	55 W	246 / 243 mA	86 %	0.96	1	-5 ... 40 °C	76 / 40 °C	1100 kΩ
	1,000 mA	15.0 V	50.0 V	15.0 W	50.0 W	57 W	264 / 260 mA	88 %	0.97	1	-5 ... 40 °C	76 / 40 °C	931 kΩ
	1,050 mA	15.0 V	47.6 V	15.8 W	50.0 W	59 W	270 / 265 mA	85 %	0.97	1	-5 ... 40 °C	76 / 40 °C	787 kΩ
	1,100 mA	15.0 V	45.5 V	16.5 W	50.1 W	56 W	253 / 254 mA	89 %	0.97	1	-5 ... 40 °C	76 / 40 °C	649 kΩ
	1,150 mA	15.0 V	43.5 V	17.3 W	50.0 W	58 W	265 / 265 mA	86 %	0.97	1	-5 ... 40 °C	76 / 40 °C	470 kΩ
	1,200 mA	15.0 V	41.7 V	18.0 W	50.0 W	58 W	260 / 264 mA	86 %	0.97	1	-5 ... 40 °C	76 / 40 °C	383 kΩ
	1,250 mA	15.0 V	40.0 V	18.8 W	50.0 W	58 W	261 / 264 mA	86 %	0.97	1	-5 ... 40 °C	76 / 40 °C	270 kΩ
	1,300 mA	15.0 V	38.5 V	19.5 W	50.1 W	58 W	260 / 264 mA	86 %	0.97	1	-5 ... 40 °C	76 / 40 °C	220 kΩ
	1,350 mA	15.0 V	37.0 V	20.3 W	50.0 W	58 W	262 / 264 mA	86 %	0.97	1	-5 ... 40 °C	76 / 40 °C	150 kΩ
	1,400 mA	15.0 V	35.0 V	21.0 W	49.0 W	59 W	264 / 264 mA	83 %	0.97	1	-5 ... 40 °C	76 / 40 °C	short circuit (0 Ω)
CF operation AC													
EM powerLED CPS FX SR 50W 50V	30 mA	–	–	0.5 W	1.7 W	3.5 W	44 mA	30 %	0.30c	1	–	–	open
	38 mA	–	–	0.6 W	2.1 W	3.8 W	46 mA	50 %	0.35c	1	–	–	6980 kΩ
	39 mA	–	–	0.6 W	2.1 W	3.8 W	46 mA	51 %	0.35c	1	–	–	6200 kΩ
	52 mA	–	–	0.9 W	2.9 W	4.6 W	49 mA	57 %	0.40c	1	–	–	5600 kΩ
	52 mA	–	–	0.9 W	2.9 W	4.6 W	49 mA	57 %	0.40c	1	–	–	4870 kΩ
	52 mA	–	–	0.9 W	2.9 W	4.6 W	49 mA	57 %	0.40c	1	–	–	4320 kΩ
	66 mA	–	–	1.1 W	3.6 W	5.2 W	51 mA	63 %	0.45c	1	–	–	3650 kΩ
	69 mA	–	–	1.1 W	3.8 W	5.3 W	51 mA	65 %	0.45c	1	–	–	2870 kΩ
	80 mA	–	–	1.3 W	4.4 W	6.0 W	54 mA	67 %	0.48c	1	–	–	2400 kΩ
	83 mA	–	–	1.4 W	4.6 W	6.0 W	54 mA	69 %	0.48c	1	–	–	2050 kΩ
	85 mA	–	–	1.4 W	4.7 W	6.0 W	54 mA	71 %	0.48c	1	–	–	1800 kΩ
	92 mA	–	–	1.5 W	5.1 W	6.7 W	58 mA	69 %	0.50c	1	–	–	1600 kΩ
	92 mA	–	–	1.5 W	5.1 W	6.7 W	58 mA	69 %	0.50c	1	–	–	1330 kΩ
	105 mA	–	–	1.6 W	5.8 W	7.3 W	59 mA	72 %	0.53c	1	–	–	1100 kΩ
	106 mA	–	–	1.6 W	5.8 W	7.3 W	59 mA	73 %	0.53c	1	–	–	931 kΩ
	118 mA	–	–	1.8 W	6.2 W	7.4 W	59 mA	76 %	0.53c	1	–	–	787 kΩ
	119 mA	–	–	1.8 W	6.0 W	7.1 W	59 mA	76 %	0.53c	1	–	–	649 kΩ
	130 mA	–	–	2.0 W	6.2 W	7.2 W	59 mA	79 %	0.53c	1	–	–	470 kΩ
	131 mA	–	–	2.0 W	6.0 W	7.2 W	59 mA	76 %	0.53c	1	–	–	383 kΩ
	144 mA	–	–	2.2 W	6.3 W	7.4 W	59 mA	78 %	0.53c	1	–	–	270 kΩ
	144 mA	–	–	2.2 W	6.1 W	7.4 W	59 mA	75 %	0.53c	1	–	–	220 kΩ
	145 mA	–	–	2.2 W	5.9 W	6.9 W	59 mA	78 %	0.53c	1	–	–	150 kΩ
	158 mA	–	–	2.4 W	6.1 W	7.4 W	59 mA	75 %	0.53c	1	–	–	short circuit (0 Ω)

[®] Ambient temperature range ta defined in normal operation[®] Output voltage range defined in normal operation. LED forward voltage will decrease in CF operation.[®] EM = Emergency


ACCESSORIES
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

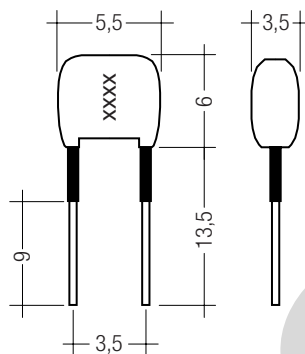
Ordering data

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

I-SELECT PLUG E

Product description

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



Ordering data

Type	Article number	Colour	Marking	Resistor value	Output current	Packaging bag	Weight per pc.
I-SELECT PLUG E	28001167	Green	69k8	69.80 k Ω	350 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001166	Green	62k	62.00 k Ω	400 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000627	Green	56k	56.00 k Ω	450 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000626	Green	48k7	48.70 k Ω	500 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000625	Green	43k2	43.20 k Ω	550 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000624	Green	36k5	36.50 k Ω	600 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000622	Green	28k7	28.70 k Ω	650 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001165	Green	24k	24.00 k Ω	700 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001164	Green	20k5	20.50 k Ω	750 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001163	Green	18k	18.00 k Ω	800 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001162	Green	16k	16.00 k Ω	850 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001161	Green	13k3	13.30 k Ω	900 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001160	Green	11k	11.00 k Ω	950 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000617	Green	9k31	9.31 k Ω	1,000 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001159	Green	7k87	7.87 k Ω	1,050 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000616	Green	6k49	6.49 k Ω	1,100 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001158	Green	4k7	4.70 k Ω	1,150 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001157	Green	3k83	3.83 k Ω	1,200 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001156	Green	2k7	2.70 k Ω	1,250 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001155	Green	2k2	2.20 k Ω	1,300 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28001154	Green	1k5	1.50 k Ω	1,350 mA	10 pc(s).	0.001 kg
I-SELECT PLUG E	28000612	Green	0R	0 k Ω	1,400 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 $\leq 1\%$.

Resistor power has to be $\geq 0.1\text{ W}$.

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).

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.

Glow-wire test

according to EN 60598-1 with increased temperature of 850 °C passed.

Temperature range

According to the standard IEC 60598-1 a LED Driver for remote installation has a max. case temperature of 90 °C. The ambient temperature range t_a for the EM powerLED CPS FX SR 50W is defined to meet this requirement.

Isolation and electric strength testing of luminaires

Electronic LED Driver 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 V_{DC} 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 M Ω .

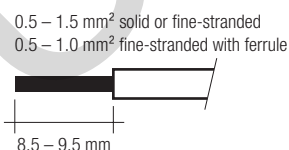
As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1,500 V_{AC} (or 1,414 x 1,500 V_{DC}). To avoid damage to the electronic devices this test **must not be conducted**.

Electrical connections**Wiring**

Mains (N, L, C/F, L link)

LED (LED +, LED -)

I set



Use one wire for each terminal connector only.



max. Ø = 10 mm
min. Ø = 6,3 mm

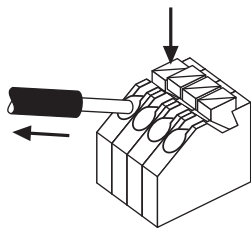
Maximum lead length

LED

3 m

Release of the wiring

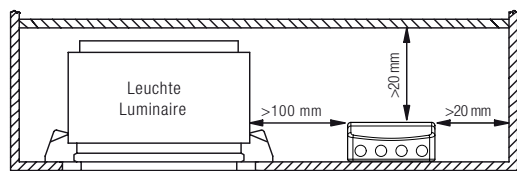
Press down the "push button" and remove the cable from front.

**Installation instruction**

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

Fixing conditions

Dry, acidfree, oilfree, fatfree. It is not allowed to exceed the maximum ambient temperature (t_a) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire. Is not suitable for fixing in corner.

**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.

Expected life-time

Type	Output power	t_a	40 °C	50 °C
EM powerLED CPS FX SR 50W 50V	10 W	t_c	56 °C	66 °C
		life-time	> 100,000 h	> 100,000 h
	20 W	t_c	59 °C	69 °C
		life-time	> 100,000 h	> 100,000 h
	30 W	t_c	63 °C	73 °C
		life-time	> 100,000 h	> 100,000 h
	40 W	t_c	69 °C	79 °C
		life-time	> 100,000 h	90,000 h
	50 W	t_c	76 °C	x
		life-time	95,000 h	x

x = not permitted

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 (t_a) before they are operated.

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 SR 50W 50V	20	30	40	50	16	24	32	40	6.6 A	30 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 SR 50W 50V	6.5 %	4.5 %	2 %	1 %

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**Polarity of the DC voltage**

L	+
N	-
CF	+
Emergency level	1

The sensor is not active in DC operation.

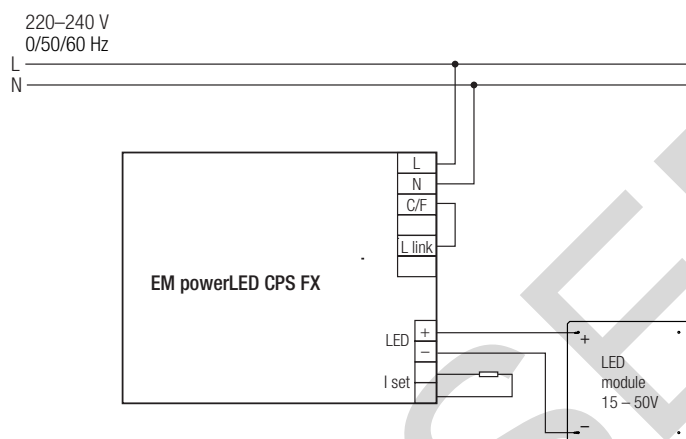
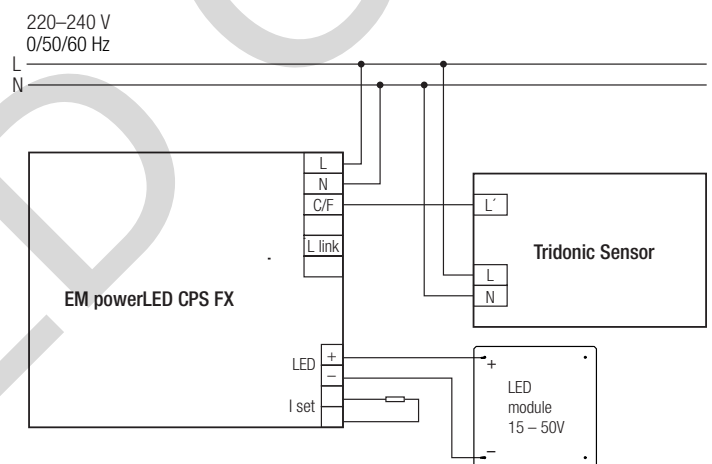
Wiring guidelines

- 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 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**Wiring diagram EM powerLED CPS FX with sensor**

When using the EM powerLED without a sensor, connect the terminals C / F and L link with a wire.

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

PIR output $\cong$ 230 V

Note

The EM powerLED CPS FX 50W 50V 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.

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.