# CC LINEAR DIP SWITCH

## COMFORTLINE DIP SWITCH L-F16

**186911, 186912**

**Typical Applications**
Built-in in linear luminaires for
- Office lighting
- Industry lighting

**ComfortLine DIP switch L-F16**

- **FLAT CASING DESIGN 16 MM**
- **SELECTABLE OUTPUT CURRENT VIA DIP SWITCH**
- **VERY LOW RIPPLE CURRENT: < 3%**
- **SUITABLE FOR EMERGENCY ESCAPE LIGHTING SYSTEMS ACC. TO EN 50172**
- **LONG SERVICE LIFE: UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**

5 YEARS GUARANTEE

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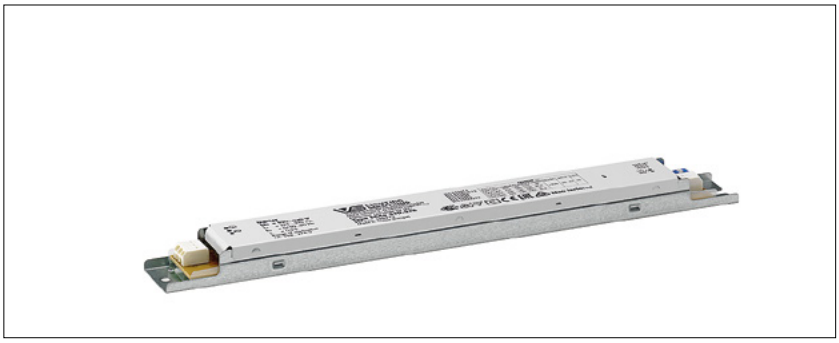
# ComfortLine DIP switch L-F16



### Product features
- Linear casing shape 16 mm

### Functions
- Selectable current output via DIP switch
- Suitable for central battery system for emergency lighting acc. to EN 50172

### Electrical features
- Mains voltage: 220–240 V ±10%
- Mains frequency: 50–60 Hz
- DC operation: 198–276 V, 0 Hz
- Push-in terminals: 0.5–1.5 mm²
- Power factor at full load: > 0.96
- Max. working voltage ($U_{OUT}$) 186911: 250 V
- Max. working voltage ($U_{OUT}$) 186911: 300 V
- Secondary side switching of LED modules is not allowed.

### Safety features
- Protection against transient main peaks up to 1 kV (between L and N) and up to 2 kV (between L, N and PE)
- Electronic short-circuit protection
- Overload protection
- Protection against "no load" operation
- Degree of protection: IP20
- Protection class I

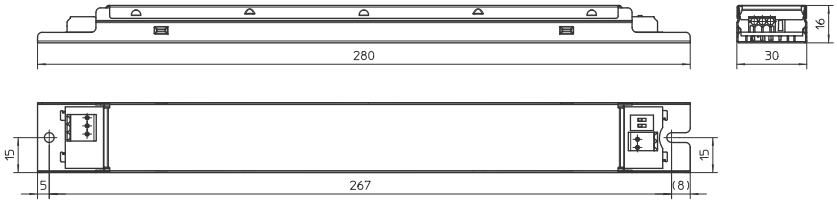
### Packaging units

| Ref. No. | Packaging unit | | |
|---|---|---|---|
| | Pieces per box | Boxes per pallet | Weight g |
| 186911 | 30 | 64 | 148 |
| 186912 | 30 | 64 | 151 |

IP20 · 110 · OVERLOAD PROTECTION · 0% NO LOAD OPERATION · EL · 50 000 hours Min. Service Lifetime · Guarantee 5 years

### Applied standards
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 61000-3-2
- EN 62384
- EN 60598-2-22
- EN 55015

### Dimensions
- Casing: M7.3
- Length: 280 mm
- Width: 30 mm
- Height: 16 mm




### Product guarantee
- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage (www.vossloh-schwabe.com). We will be happy to send you these conditions upon request.



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## Electrical characteristics

| Max. output W | Type | Ref. No. | Voltage 50–60 Hz V | Mains current mA | Inrush current A / µs | Current output DC mA (± 5%) | Voltage output DC (V) | THD at full load % (230 V) | Efficiency at full load % (230 V) | Ripple 100 Hz % |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | ECXe 350.375 | **186911** | 220–240 | 180–165 | 31.3 / 101 | 200 | 50–100 | < 14 | 90 | < 3 |
| 25 | | | | | | 250 | | | 91 | |
| 30 | | | | | | 300 | | | 91.5 | |
| 35 | | | | | | 350 | | | 92 | |
| 38 | ECXe 350.376 | **186912** | 220–240 | 325–300 | 36 / 169 | 200 | 90–190 | < 12 | 93 | < 3 |
| 47 | | | | | | 250 | | | 94 | |
| 57 | | | | | | 300 | | | 94 | |
| 66 | | | | | | 350 | | | 94 | |

## Maximum ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the drivers.

| Ref. No. | Ambient temperature range °C min. | °C max. | Operation humidity range % min. | % max. | Storage temperature range °C min. | °C max. | Storage humidity range % min. | % max. | Max. operation temperature at $t_c$ point °C | Degree of protection |
|---|---|---|---|---|---|---|---|---|---|---|
| 186911 | –25 | +65 (200–300 mA) | 5 | 60 | –40 | +85 | 5 | 95 | +75 | IP20 |
| | | +60 (350 mA) | | | | | | | | |
| 186912 | –25 | +55 | | | | | | | +70 | |

## Expected service life time

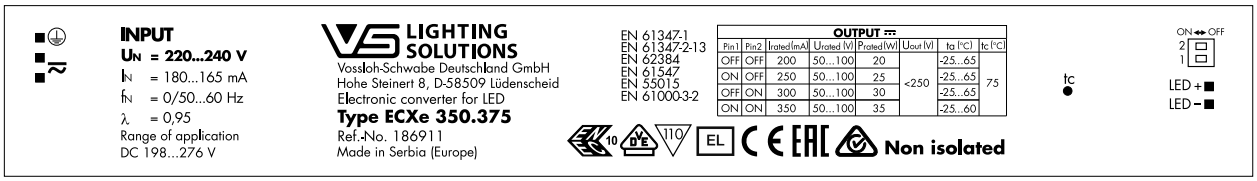
at operation temperatures at $t_c$ point

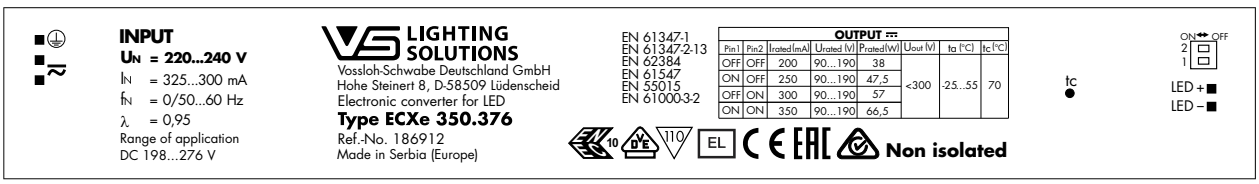
| Operation current | Ref. No. 186911 | | 186912 | |
|---|---|---|---|---|
| All | 65 °C | 75 °C | 60 °C | 70 °C |
| hrs. | 100,000 | 50,000 | 100,000 | 50,000 |

## DIP switch settings

| Pin 1 | Pin 2 | Operation current (mA) 186911, 186912 |
|---|---|---|
| OFF | OFF | 200 |
| ON | OFF | 250 |
| OFF | ON | 300 |
| ON | ON | 350 |

## Product labels





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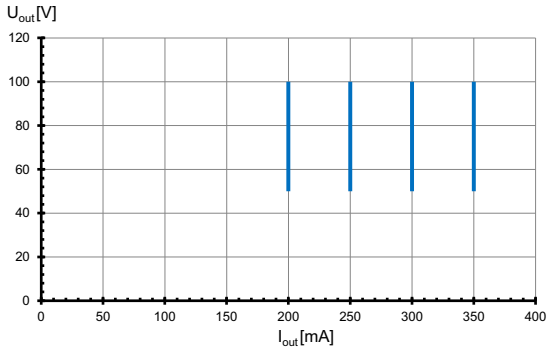
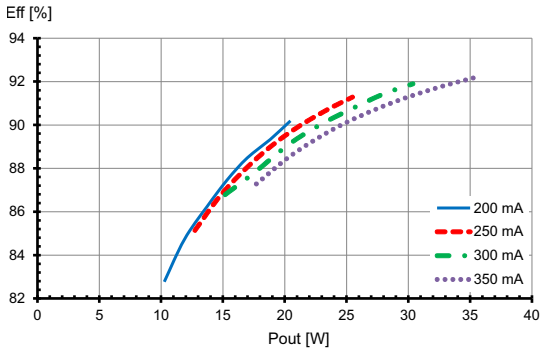
### Typ. performance graphs for 186911 / Type ECXe 350.376

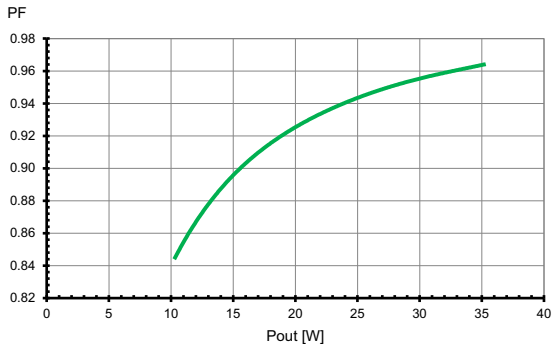
**Working area**



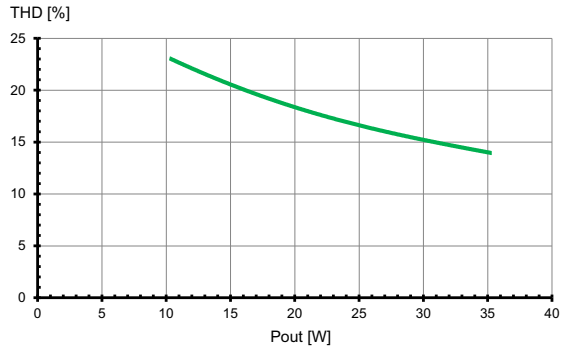

**Efficiency**




**Power factor**

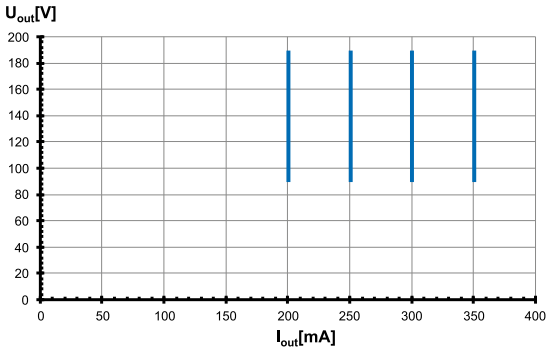



**Total harmonic factor (THD)**

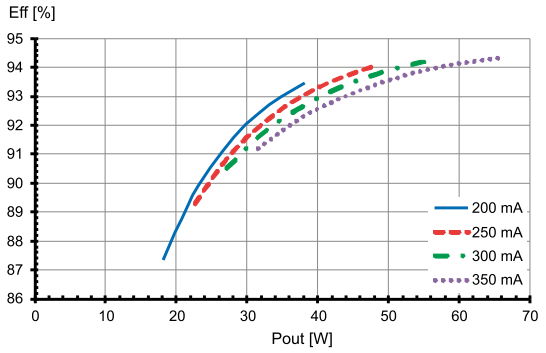



### Typ. performance graphs for 186912/ Type ECXe 350.376

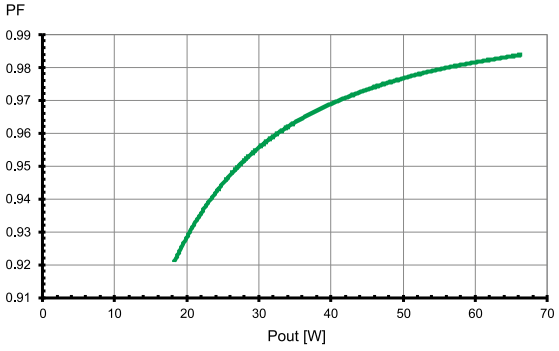
**Working area**



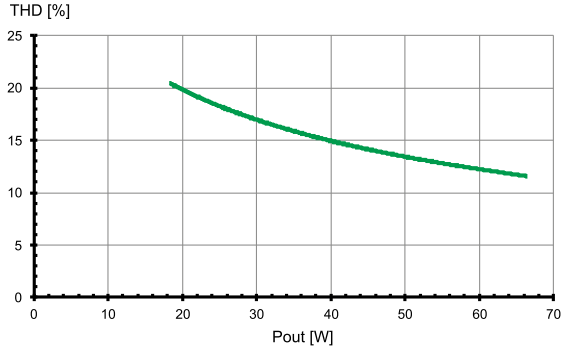

**Efficiency**




**Power factor**




**Total harmonic factor (THD)**





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**Safety functions**

- Transient mains peaks protection:
  Values are in compliance with EN 61547 (interference immunity).
  Surges between L–N: up to 1 kV
  Surges between L/N–PE: up to 2 kV
- Short-circuit protection: The control gears are protected against permanent short-circuit with automatic restart function.
- Overload protection: The control gears only work in range of rated output power and voltage problemfree. Please check before switch-on mains power supply that the selected LED load is suitable (see Electrical Characteristics on data sheet).
- No load operation: The control gear is protected against no load operation (open load).
- If any of the above mentioned safety functions will be triggered, disconnect the control gear from the power supply then find and eliminate the cause of the problem.

**Output voltage ($U_{OUT}$)**

According to EN 61347-1, $U_{OUT}$ indicates which voltage can occur at the output terminals directly or between the output terminals and the PE terminal of the LED driver. This value is given for non-insulated drivers. The used LED module must have an insulation voltage that is at least as high as the specified $U_{OUT}$ voltage of the driver.

**Leakage current**

Leakage currents are present in all electronic converters or luminaires with PE connection and must be observed especially when using non-insulated LED drivers.
The PCB surfaces of LED modules form a capacitance with grounded LED aluminum circuit boards, heat sinks or mounting plates. This leads to capacitive leakage currents between the connection poles of the LED (+ and –) and the PE terminal. These capacitances should be kept as small as possible, since they are responsible for a possible glowing or flickering of the LEDs in standby mode. In extreme cases, the maximum permissible leakage current of the luminaire according to EN 60598 paragraph 10.3 may be exceeded. The leakage current is also relevant when using RCD circuit breakers.

**DC and emergency lighting operation**

The control gears are suitable for direct voltage operation (DC). Reliable DC operation is guaranteed if the specified working area of LED driver is maintained.

- DC range: 198–276 V
- Reducing to 176 V: With reduced service life time possible
- Light level at DC operation ($EOF_i$): 100% (not adjustable)
- DC operation: 3 hrs. according to EN 50172





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# Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advices must be observed; non-observance can result in the destruction of the LED drivers, fire and/or other hazards.

### Mandatory regulations

- DIN VDE 0100
- EN 60598-1

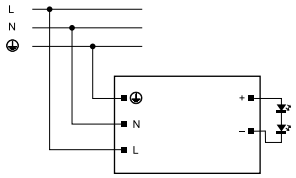
### Mechanical mounting

- Mounting position: Built-in: Any position inside a luminaire is allowed
  Independent application: Drivers are not allowed to use for independent applications
- Mounting location: LED drivers are designed for integration into luminaires or comparable devices.
  Installation in outdoor luminaires: degree of protection for luminaire with water protection rate ≥ 4 (e.g. IP54 required).
- Degree of protection: IP20
- Clearance: Min. 0.10 m from walls. ceilings and insulation
- Surface: Solid and plane surface for optimum heat dissipation required.
- Heat transfer: If the driver is destined for installation in a luminaire. sufficient heat transfer must be ensured between the driver and the luminaire casing.
  LED drivers should be mounted with the greatest possible clearance to heat sources.
  During operation. the temperature measure at the driver's $t_c$ point must not exceed the specified maximum value.
- Fastening: Using M4 screws in the designated holes

### Electrical installation

- Connection terminals: Push-in terminals for rigid conductors with a section of 0.5–1.5 mm²; AWG20-16
- Stripped length: 8–9 mm
- Wiring: The mains conductor within the luminaire must be kept short (to reduce the induction of interference).
  Mains and lamp conductors must be kept separate and if possible should not be laid in parallel to one another.
- Polarity: Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- Secondary load: The sum of forward voltages of LED loads has to be within the tolerances which are mentioned in the table "Electrical Characteristics" in this data sheet.

- Wiring diagram:




### Selection of automatic cut-outs for VS LED drivers

- Dimensioning automatic cut-outs
  High transient currents occur when an LED driver is switched on because the capacitors have to load. Ignition of LED modules occurs almost simultaneously. This also causes a simultaneous high demand for power. These high currents when the system is switched on put a strain on the automatic conductor cut-outs. which must be selected and dimensioned to suit.
- Release reaction
  The release reaction of the automatic conductor cut-outs comply with VDE 0641. part 11. for B. C characteristics. The values shown in the following tables are for guidance purposes only and are subject to system-dependent change.
- No. of LED drivers
  The maximum number of VS LED drivers applies to cases where the devices are switched on simultaneously. Specifications apply to single-pole fuses. The number of permissible drivers must be reduced by 20% for multi-pole fuses. The considered circuit impedance equals 400 mΩ (approx. 20 m [2.5 mm²] of conductor from the power supply to the distributor and a further 15 m to the luminaire).

| Type | **Ref. No.** | Automatic cut-out type and possible no. of VS drivers pcs. | | | | | |
|---|---|---|---|---|---|---|---|
| **Automatic cut-out type** | | B 10 A | B 13 A | B 16 A | C 10 A | C 13 A | C 16 A |
| ECXe 350.375 | **186911** | 27 | 35 | 43 | 45 | 59 | 72 |
| ECXe 350.376 | **186912** | 13 | 17 | 21 | 22 | 29 | 36 |

– To limit capacitive inrush currents the current carrying capacity of each circuit breaker (fuse) can be increased with the help of our ESB (Ref. No.: 149820, 149821, 149822) inrush current limiters.





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