

## EasyLine Poti S 100 V IP

### Product features

- Compact casing shape

### Functions

- Selectable current output via potentiometer

### Electrical features

- Mains voltage: 100–277 V  $\pm 10\%$
- Mains frequency: 50/60 Hz
- Pre-assembled connection leads:
  - primary: 3x1 mm<sup>2</sup> (AWG17), length: 300 mm
  - secondary: 2x1 mm<sup>2</sup> (AWG17), length: 300 mm
- Power factor at full load: > 0.97
- Open circuit voltage ( $U_{max}$ ) / Max. working voltage ( $U_{OUT}$ ):

| Ref. No. | $U_{max}$ (V) | $U_{OUT}$ (V) |
|----------|---------------|---------------|
| 187090   | —             | 214           |
| 187091   | —             | 285           |

- Secondary side switching of LED modules is not allowed.

### Safety features

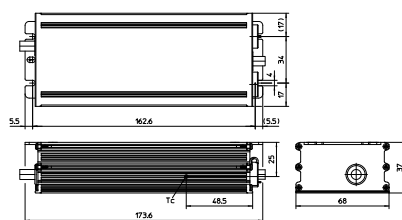
- Protection against transient main peaks up to 5 kV (between L and N) and up to 10 kV (between L/N and PE)
- Electronic short-circuit protection
- Overload protection
- Overtemperature protection
- Protection against "no load" operation
- Degree of protection: IP67
- Protection class I
- SELV (only for 187088)

### Packaging units

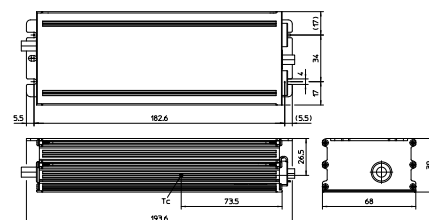
| Ref. No. | Packaging unit |                  | Weight<br>g |
|----------|----------------|------------------|-------------|
|          | Pieces         | Boxes            |             |
| 187088   | per box<br>10  | per pallet<br>49 | 550         |
| 187089   | per box<br>10  | per pallet<br>49 | 700         |
| 187090   | 10             | 49               | 800         |
| 187091   | 10             | 42               | 950         |



M89



M90



187088

187088

187089,

187090,

187091,

187092,

187093



### Applied standards

- EN 61000-3-2
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 62384
- EN 55015

### Dimensions

| Ref. No. | Casing | Length<br>mm | Width<br>mm | Height<br>mm |
|----------|--------|--------------|-------------|--------------|
| 187090   | M89    | 173,6        | 68          | 37           |
| 187091   | M90    | 193,6        | 68          | 39           |



### Current adjustment



### 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](http://www.vossloh-schwabe.com)). We will be happy to send you these conditions upon request.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

## Electrical characteristics

| Max. output W | Type          | Ref. No.      | Voltage 50–60 Hz V $\pm$ 10% | Mains current mA | Inrush current A / $\mu$ s | Current output DC mA ( $\pm$ 5%) | Factory settings mA | Voltage output DC (V) | THD at full load % (230 V) | Efficiency at full load % (230 V) | Ripple 100 Hz % |
|---------------|---------------|---------------|------------------------------|------------------|----------------------------|----------------------------------|---------------------|-----------------------|----------------------------|-----------------------------------|-----------------|
| 150           | ECXe 1050.454 | <b>187090</b> | 100–277                      | 1700–600         | 68 / 308                   | 530–1050                         | 700                 | 100–214               | 3                          | 94,5                              | < 10            |
| 200           | ECXe 1050.455 | <b>187091</b> | 100–277                      | 2300–820         | 86 / 336                   | 530–1050                         | 700                 | 130–286               | 4                          | 93,5                              | < 5             |

## Maximum ratings

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

| Ref. No.  | Ambient temperature range |         | Operation humidity range |        | Storage temperature range |         | Storage humidity range |        | Max. operation temperature at $t_c$ point °C | Degree of protection |
|-----------|---------------------------|---------|--------------------------|--------|---------------------------|---------|------------------------|--------|--|----------------------|
|           | °C min.                   | °C max. | % min.                   | % max. | °C min.                   | °C max. | % min.                 | % max. |  |                      |
| All types | -40                       | +60     | 5                        | 95     | -40                       | +85     | 5                      | 95     | +75 ( $t_c, wa$ )*; +90 ( $t_c, sa$ )*       | IP67                 |

\*  $t_c, wa$ .: ( $t_c, warranty$ ) |  $t_c, sa$ .: ( $t_c, safety$ )

## Expected service life time

at operation temperatures at  $t_c$  point \*\*

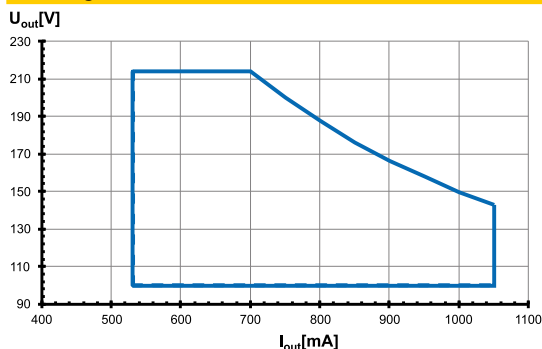
| Operation current | Ref. No.  |        |
|-------------------|-----------|--------|
|                   | All types |        |
| All               | 65 °C     | 75 °C  |
| hrs.              | 100,000   | 50,000 |

\*\* Refer to lifetime vs.  $t_c$  curve for further details

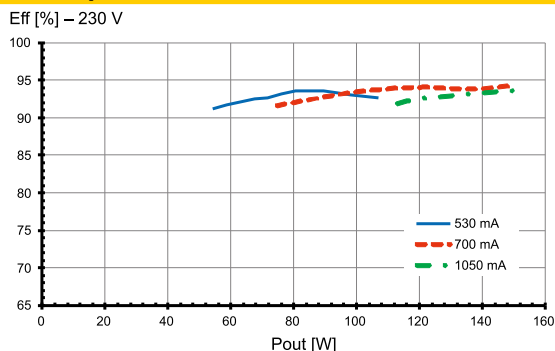
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## Typ. performance graphs for 187090 / Type ECXe 1050.454

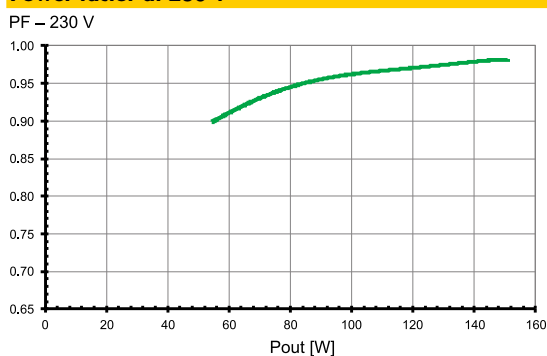
### Working area



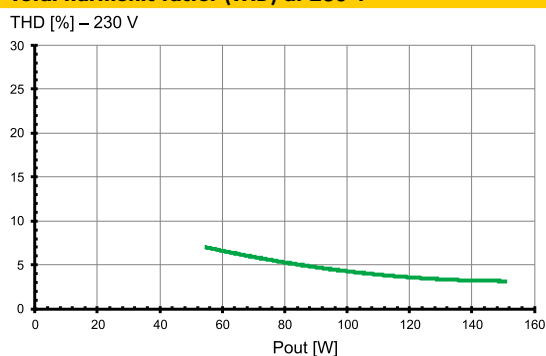
### Efficiency at 230 V



### Power factor at 230 V

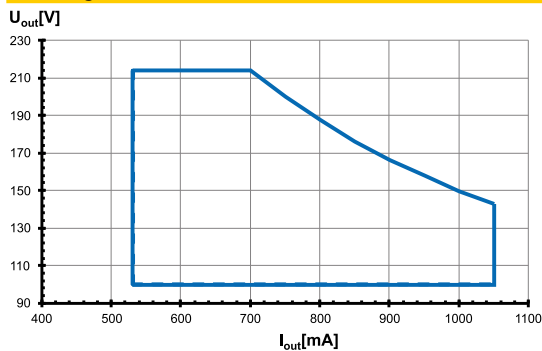


### Total harmonic factor (THD) at 230 V

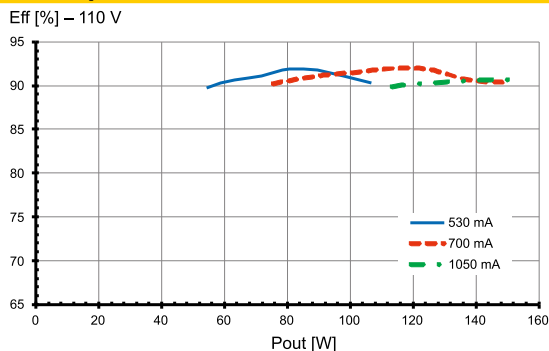


## Typ. performance graphs for 187090 / Type ECXe 1050.454

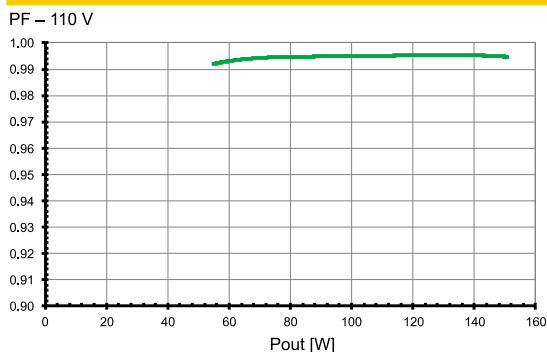
### Working area



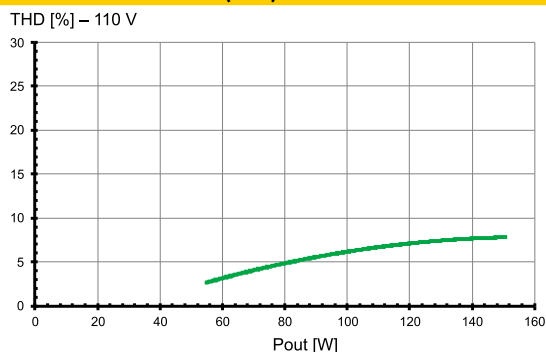
### Efficiency at 110 V



### Power factor at 110 V



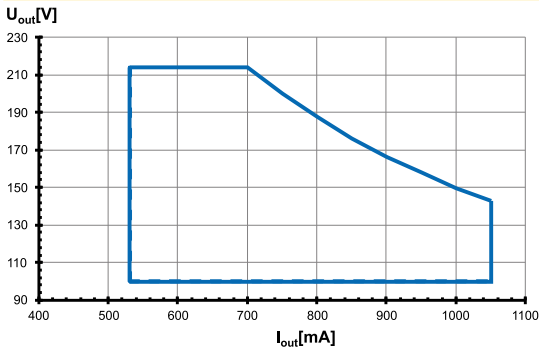
### Total harmonic factor (THD) at 110 V



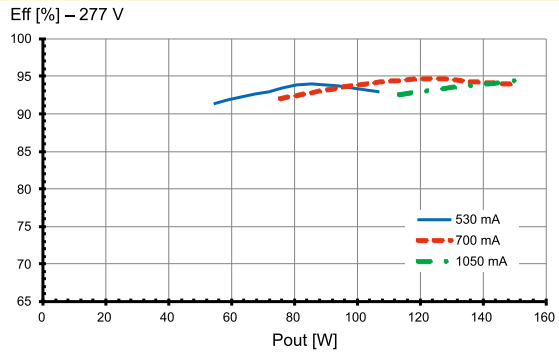
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## Typ. performance graphs for 187090 / Type ECXe 1050.454

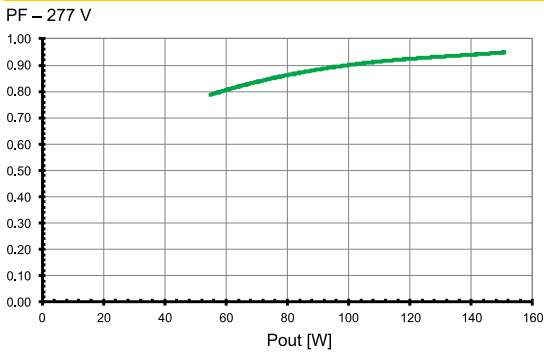
### Working area



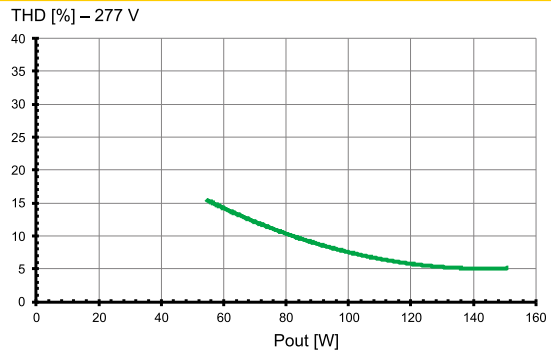
### Efficiency at 277 V



### Power factor at 277 V

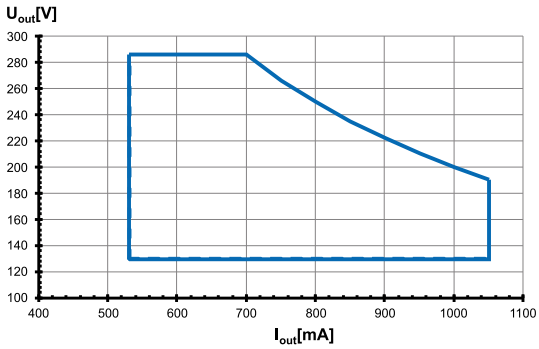


### Total harmonic factor (THD) at 277 V

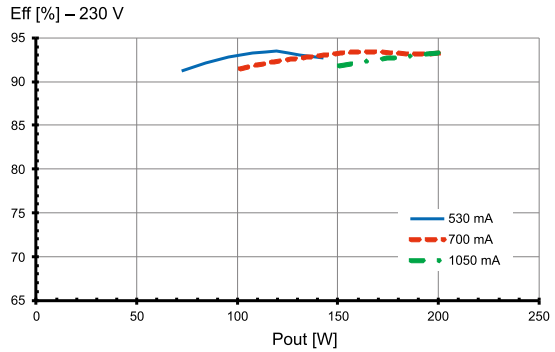


## Typ. performance graphs for 187091 / Type ECXe 1050.455

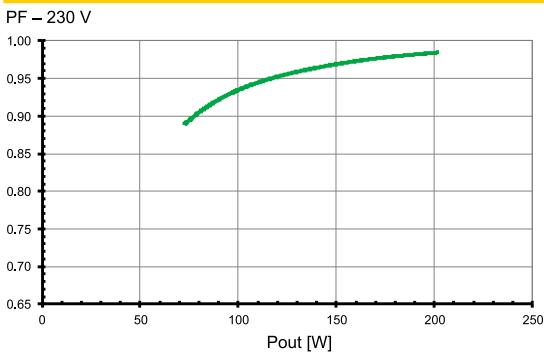
### Working area



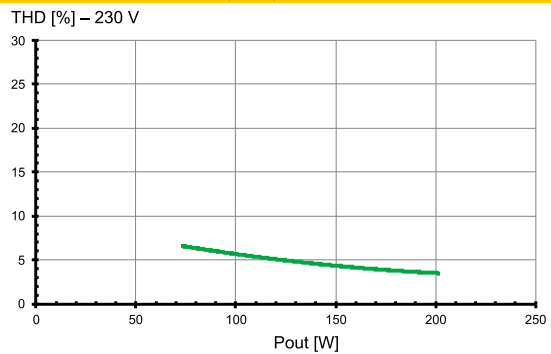
### Efficiency at 230 V



### Power factor at 230 V



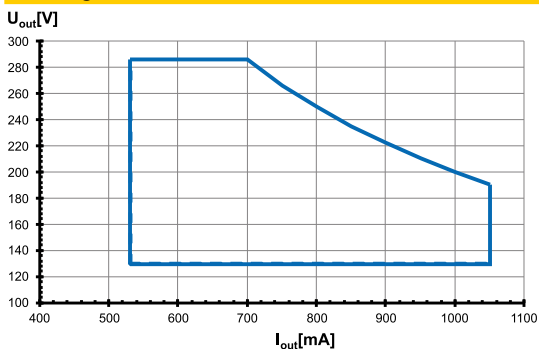
### Total harmonic factor (THD) at 230 V



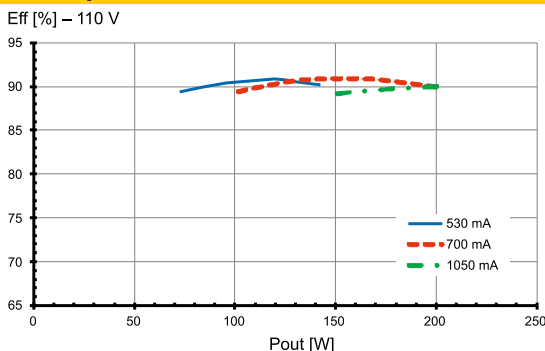
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## Typ. performance graphs for 187091 / Type ECXe 1050.455

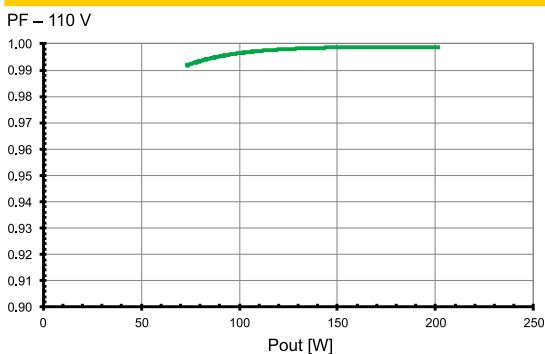
### Working area



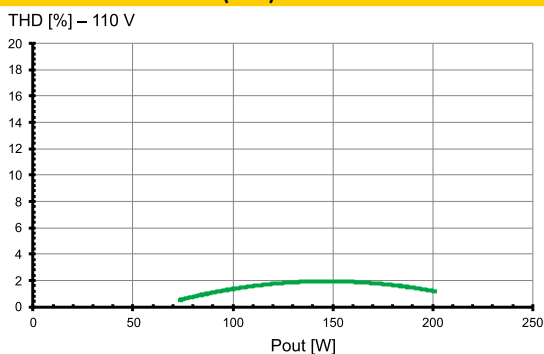
### Efficiency at 110 V



### Power factor at 110 V

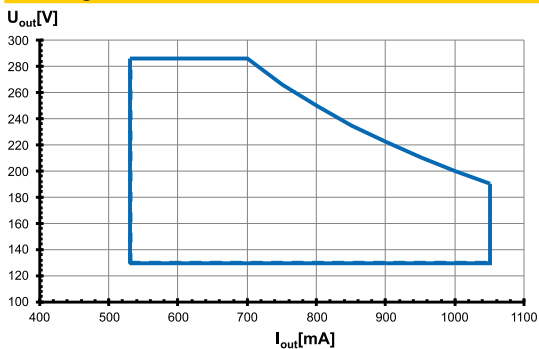


### Total harmonic factor (THD) at 110 V

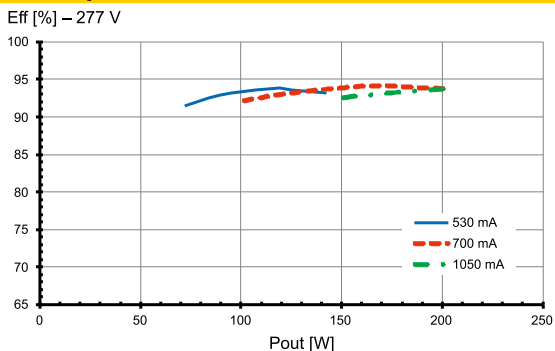


## Typ. performance graphs for 187091 / Type ECXe 1050.455

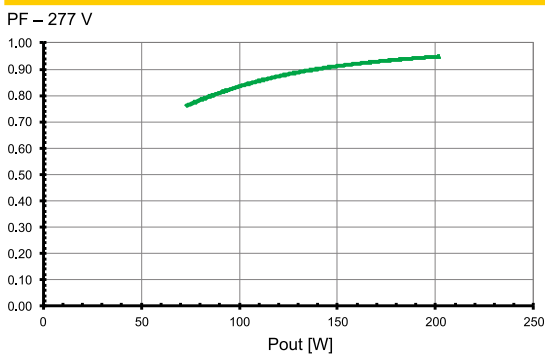
### Working area



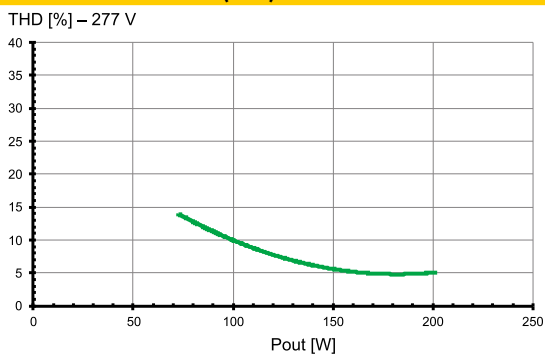
### Efficiency at 277 V



### Power factor at 277 V



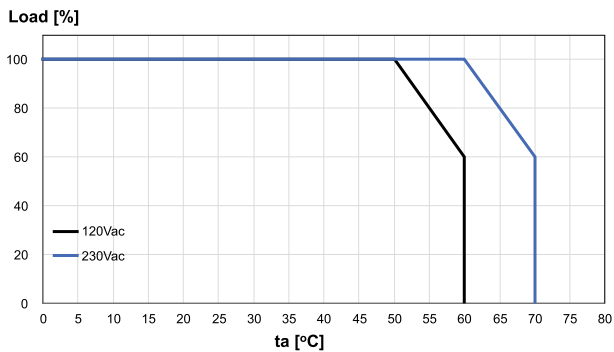
### Total harmonic factor (THD) at 277 V



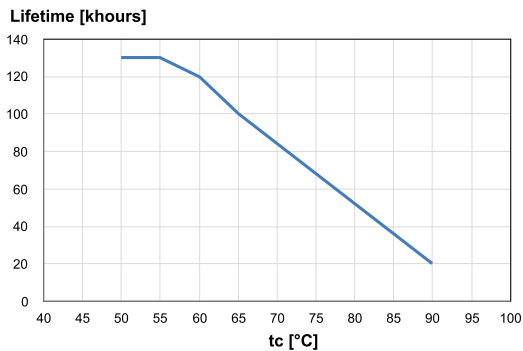
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## Load derating

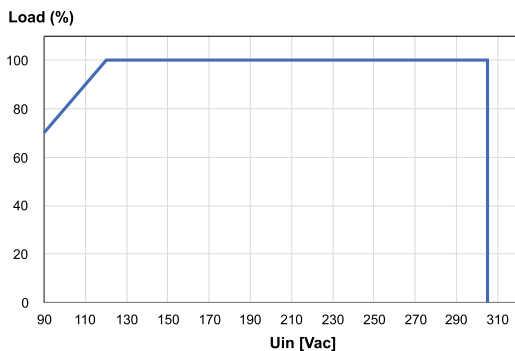
### Load (%) vs. Ambient temperature $t_a$ (°C)



### Lifetime (khours) vs. Casing temperature $t_c$ (°C)



### Load (%) vs. Input voltage $U_{in}$ (V AC)



## Safety functions

- Transient mains peaks protection: Values are in compliance with EN 61547 (interference immunity). Surges between L-N: up to 5 kV and between L/N-PE: up to 10 kV
- Short-circuit protection: The control gear is protected against permanent short-circuit with automatic restart function.
- Overload protection: The control gears have overload protection. In case of overload the control gear will reduce the output current.
- Overheating: The control gear has overheating protection. In case of overheating the control gear will reduce the output current and shut down.
- No load operation: The control gear is protected against no load operation (open load) and switches off when no load is connected.
- 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.

## 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

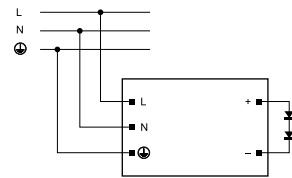
- Mounting position: Built-in: Any position inside a luminaire is allowed
- Mounting location: LED drivers are designed for integration into luminaires or comparable devices.
- Degree of protection: IP67  
The driver operate normal under temporary immersion between 0,15 m and 1 m with the condition of the duration time is less than 30 min. and the water temperature does not differ from that of the driver by more than 5 K.
- 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
- Tightening torque: 0.2 Nm

### Electrical installation

- The wire connection should be installed by professional person, reinforced insulation between L/N terminal block and accessible part should be fulfilled.
- The external flexible cable or cord of the LED driver cannot be replaced; if the cord is damaged, the LED driver shall be destroyed.
- During and after installation the connection of input terminal and output terminal should be enclosed to far away from water source.
- Output connection shall be installed by professional person, at least basic insulation corresponding to its max. output voltage should be maintained between current-carrying part of LED modules output and accessible surface or mounting surface after installation.  
187088: At least one pole of the conductive parts in the SELV circuit shall be insulated by insulation capable of withstanding a test voltage of 500 V r.m.s. for 1 min.
- Stripped length: 10 mm
- Terminal block not included. Installation must be performed by a qualified person.

- 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.
- Through-wiring: Is not allowed.
- 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 mm<sup>2</sup>] 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 1050.452          | <b>187088</b> | 7  | 9      | 11     | 12     | 15     | 19     |
| ECXe 1050.453          | <b>187089</b> | 4  | 5      | 6      | 6      | 8      | 10     |
| ECXe 1050.454          | <b>187090</b> | 3  | 4      | 6      | 5      | 6      | 8      |
| ECXe 1050.455          | <b>187091</b> | 3  | 4      | 4      | 4      | 5      | 7      |
| ECXe 1050.456          | <b>187092</b> | 2  | 3      | 4      | 3      | 3      | 5      |
| ECXe 1100.457          | <b>187093</b> | 1  | 1      | 2      | 2      | 3      | 3      |

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