

# CC LINEAR DIP SWITCH



## COMFORTLINE DIP SWITCH L DALI2

**187335, 187336, 187337, 187338, 187339, 187416**

### Typical Applications

Built-in in linear luminaires for

- Office lighting
- Industry lighting



### ComfortLine DIP switch L DALI2

- **SELECTABLE OUTPUT CURRENT VIA DIP SWITCH**
- **VERY LOW RIPPLE CURRENT: < 3%**
- **ENEC APPROVED**
- **LONG SERVICE LIFE:  
UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**



## ComfortLine DIP switch L DALI2

### Product features

- Linear casing shape

### Functions

- Selectable current output via DIP switch

### 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 mm<sup>2</sup>
- Power factor at full load: 0.95
- Max. working voltage (U<sub>OUT</sub>): 250 V except 275 V for 187336
- Secondary side switching of LED modules is not allowed.

### Dimming

- Dimming range: 1 to 100 %

### 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
- Over temperature protection
- Protection class I

### Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
187335	20	125	132
187416	20	125	210
187336	20	125	160
187337	20	125	151
187338	20	125	160
187339	20	125	160



### Applied standards

- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 61000-3-2
- EN 62384
- EN 55015
- IEC 62386 DALI Ed. 2 part 101, 102, 207
- EN 50172

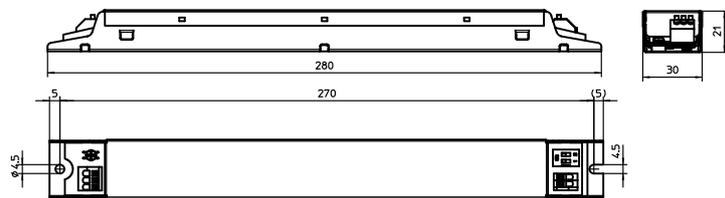


### Dimensions

- Casing: M72
- Length: 280 mm
- Width: 30 mm
- Height: 21 mm

### Dimming

Analogue



### 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	Mains current mA	Inrush current A / $\mu$ s	Current output DC mA ( $\pm$ 5%)	Voltage output DC (V)	THD at full load % (230 V)	Efficiency at full load % (230 V)	Ripple 100 Hz %
26	ECXd 350.628	<b>187335</b>	220–240	230–205	31 / 170	200	40–130	<5	>90	<3
32.5						250				
39						300				
45.5						350				
38	ECXd350.665	<b>187416</b>	220–240	330–295	31 / 200	200	90–190	< 4	> 92	<3
47.5						250				
57						300				
66.5						350				
48	ECXd 350.629	<b>187336</b>	220–240	405–370	37 / 240	200	120–240	<4	>93	<3
60						250				
72						300				
84						350				
45.5	ECXd 500.630	<b>187337</b>	220–240	325–290	33 / 200	350	40–130	<4	>91	<3
52						400				
58.5						450				
65						500				
63	ECXd 500.631	<b>187338</b>	220–240	440–405	37 / 256	350	90–180	<5	>92	<3
72						400				
81						450				
90						500				
71.5	ECXd 700.632	<b>187339</b>	220–240	440–405	37 / 251	550	40–130	<4	>92	<3
78						600				
84.5						650				
91						700				

## 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.		
187335, 187416, 187337	-25	+55	5	60	-40	+85	5	95	+75	IP20
187336, 187338, 187339	-25	+50								

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# LED Drivers – ComfortLine DIP Switch L-DALI2

## Operating Life

at operation temperatures at  $t_c$  point

Operation current	Ref. No.	
	all types	
all types	75°C	65°C
hrs.	50,000	100,000

## DIP switch settings

Pin 1	Pin 2	Operation current (mA)		
		187335, 187416, 186336	187337, 187338	187339
OFF	OFF	200	350	550
ON	OFF	250	400	600
OFF	ON	300	450	650
ON	ON	350	500	700

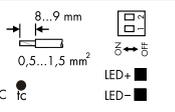
## Product labels

**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=230...205mA  
fn =0/50/60Hz  
λ =0,80C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 350.628**  
Ref.-No. 187335  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	200	26	40...130	<250
ON	OFF	250	32,5	40...130	
OFF	ON	300	39	40...130	
ON	ON	350	45,5	40...130	

**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C

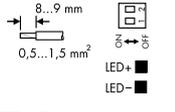


**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=405...370mA  
fn =0/50/60Hz  
λ =0,89C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 350.629**  
Ref.-No. 187336  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	200	48	120...240	<275
ON	OFF	250	60	120...240	
OFF	ON	300	72	120...240	
ON	ON	350	84	120...240	

**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C

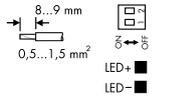


**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=325...290mA  
fn =0/50/60Hz  
λ =0,84C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 500.630**  
Ref.-No. 187337  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	350	45,5	40...130	<250
ON	OFF	450	60	40...130	
OFF	ON	450	58,5	40...130	
ON	ON	500	65	40...130	

**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C

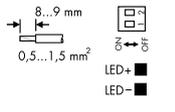


**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=440...405mA  
fn =0/50/60Hz  
λ =0,93C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 500.631**  
Ref.-No. 187338  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	350	63	90...180	<250
ON	OFF	400	72	90...180	
OFF	ON	450	81	90...180	
ON	ON	500	90	90...180	

**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C

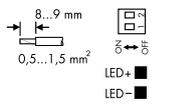


**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=440...405mA  
fn =0/50/60Hz  
λ =0,90C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 700.632**  
Ref.-No. 187339  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	550	71,5	40...130	<250
ON	OFF	600	78	40...130	
OFF	ON	650	84,5	40...130	
ON	ON	700	91	40...130	

**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C

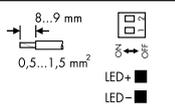


**DA/N** INPUT  
**DA/L** **UNS=220-240V~**  
In=330...295mA  
fn =0/50/60Hz  
λ =0,89C...0,99  
**N**  
**L** ≈  
Range of application  
DC 198...276 V

**VSLIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
LED 控制装置  
**Type ECXd 350.665**  
Ref.-No. 187416  
Made in China

OUTPUT ---					
Pin1	Pin2	Irated[mA]	Prated[W]	Urated[V]	Uout[V]
OFF	OFF	200	38	90...190	<250
ON	OFF	250	47,5	90...190	
OFF	ON	300	57	90...190	
ON	ON	350	66,5	90...190	

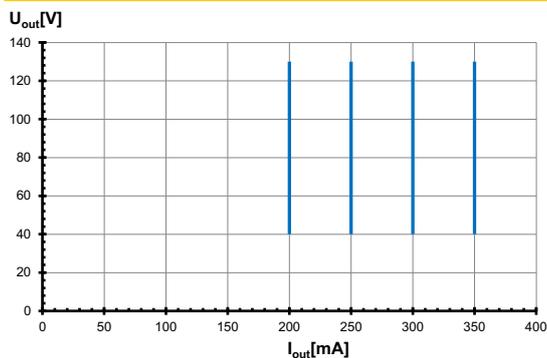
**DALI**  
**PUSH**  
Non isolated  
tc=75°C  
ta=25...55°C



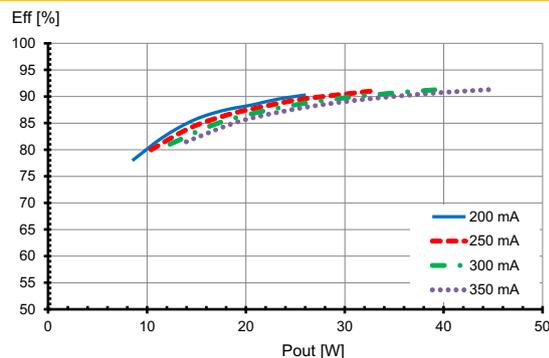
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

## Typ. performance graphs for 187335 / Type ECXe 350.628

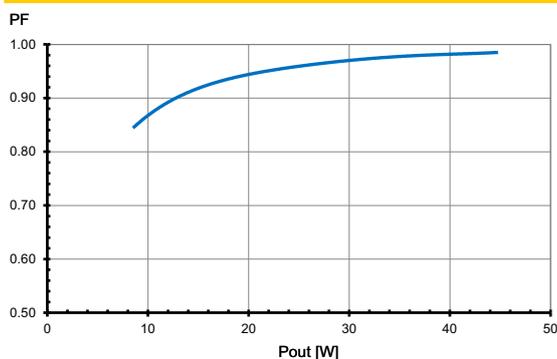
### Working area



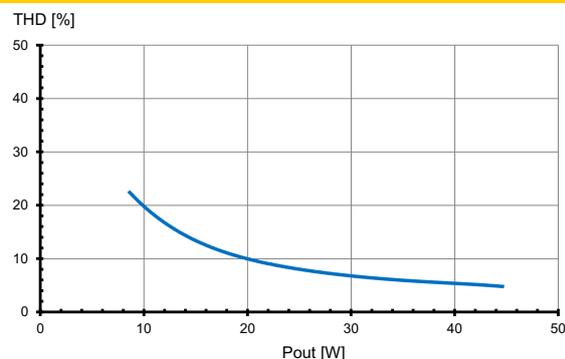
### Efficiency



### Power factor

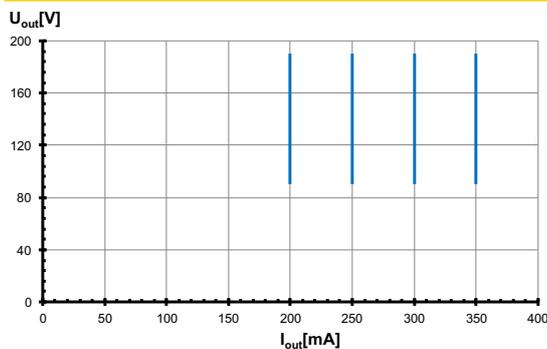


### Total harmonic factor (THD)

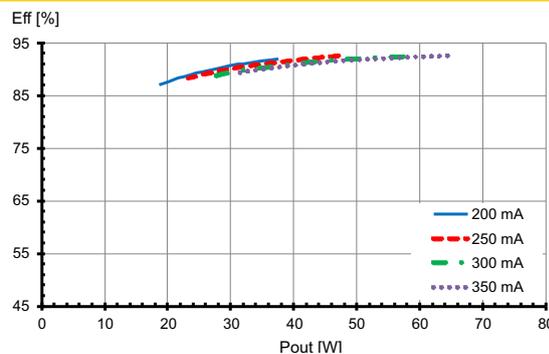


## Typ. performance graphs for 187416 / Type ECXd350.665

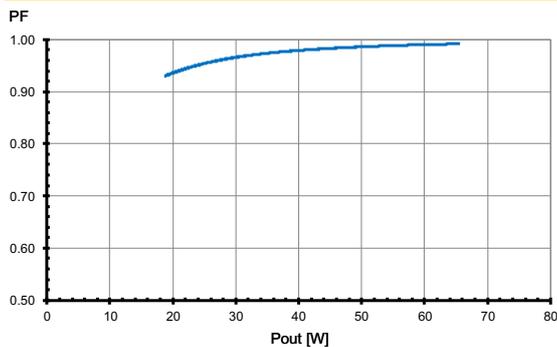
### Working area



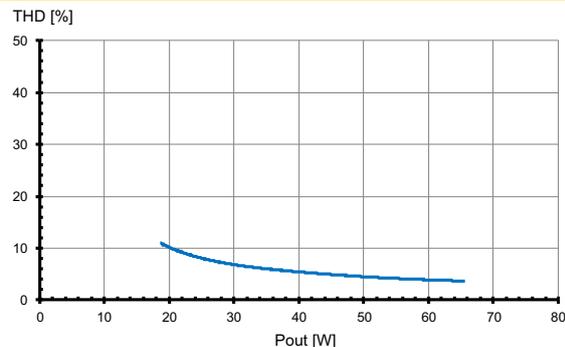
### Efficiency



### Power factor



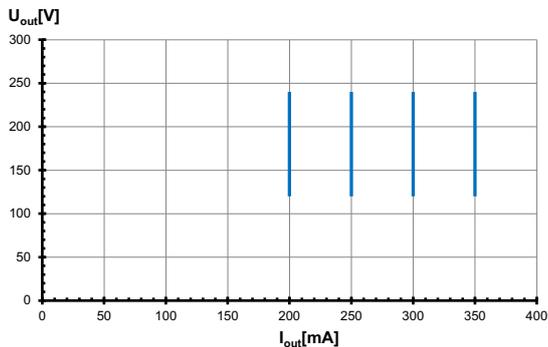
### Total harmonic factor (THD)



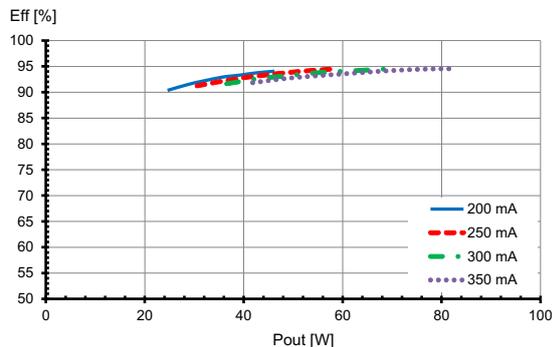
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

## Typ. performance graphs for 187336 / Type ECXe 350.629

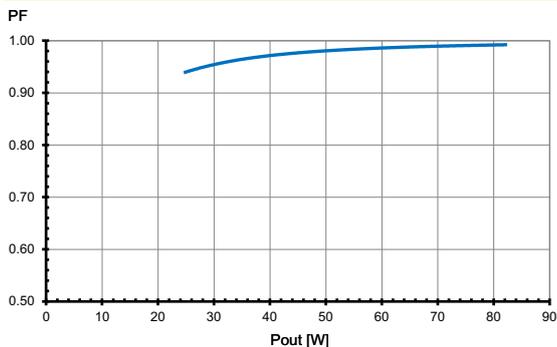
### Working area



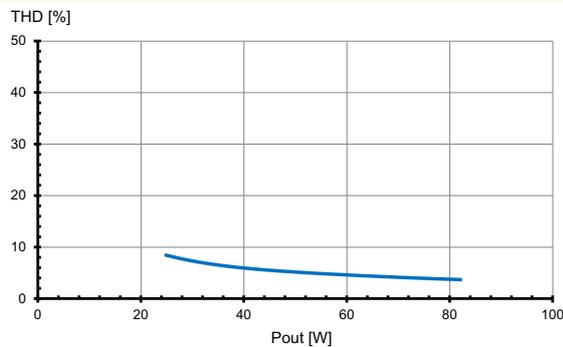
### Efficiency



### Power factor

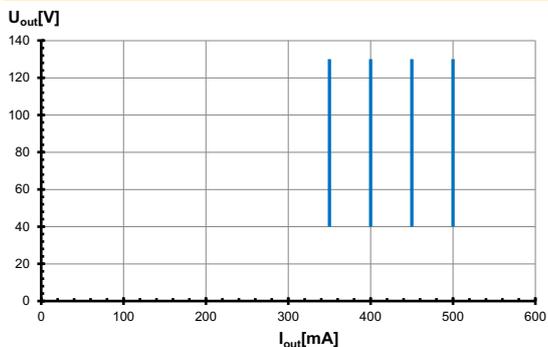


### Total harmonic factor (THD)

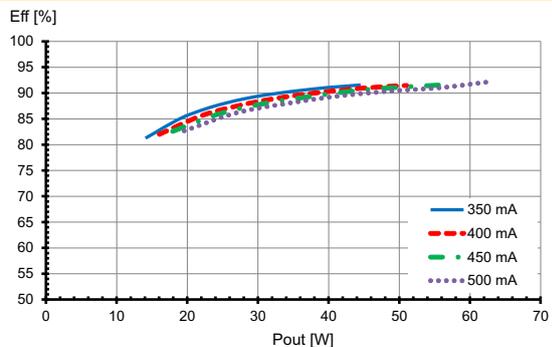


## Typ. performance graphs for 187337 / Type ECXe 500.630

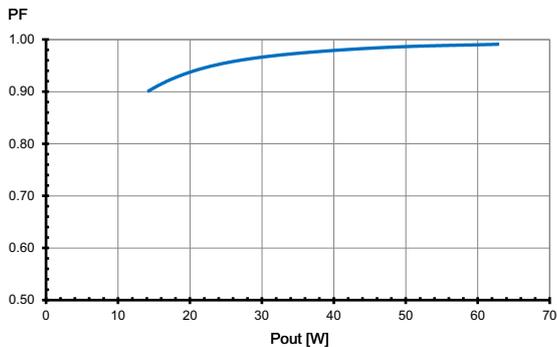
### Working area



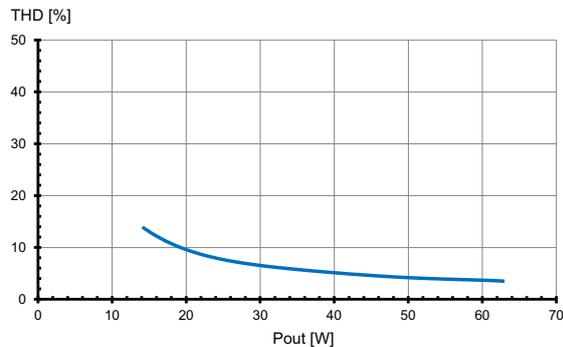
### Efficiency



### Power factor



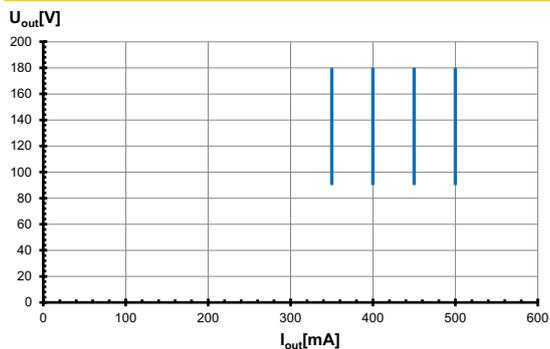
### Total harmonic factor (THD)



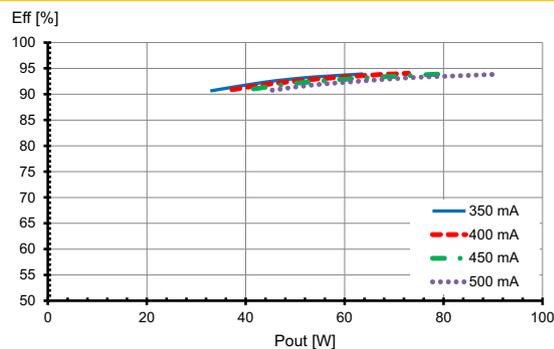
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

## Typ. performance graphs for 187338 / Type ECXe 500.631

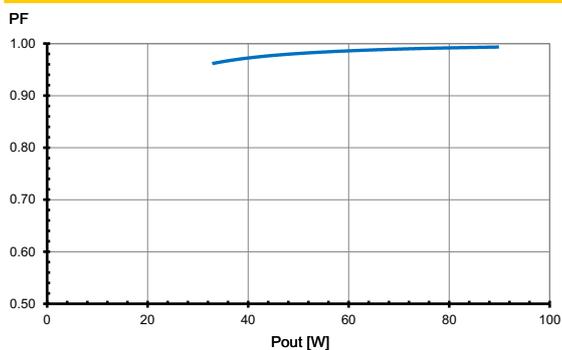
### Working area



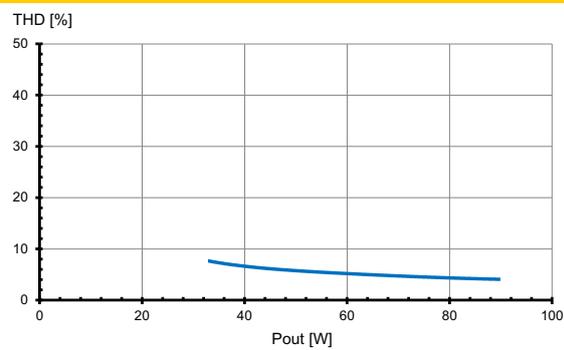
### Efficiency



### Power factor

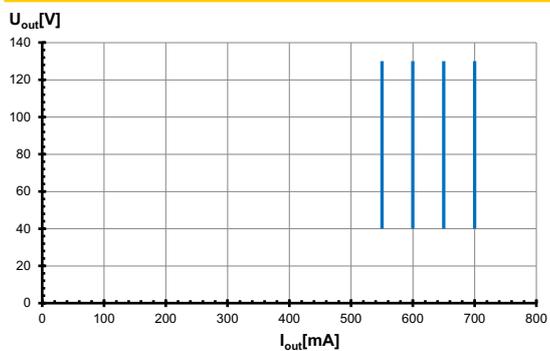


### Total harmonic factor (THD)

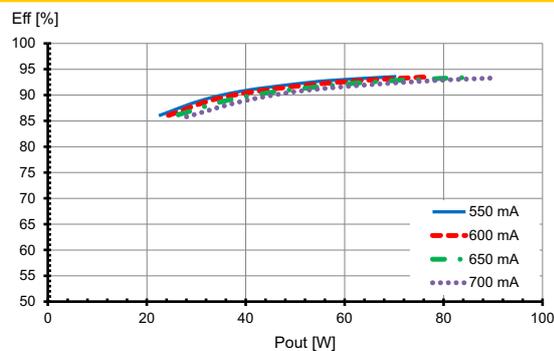


## Typ. performance graphs for 187339 / Type ECXe 700.632

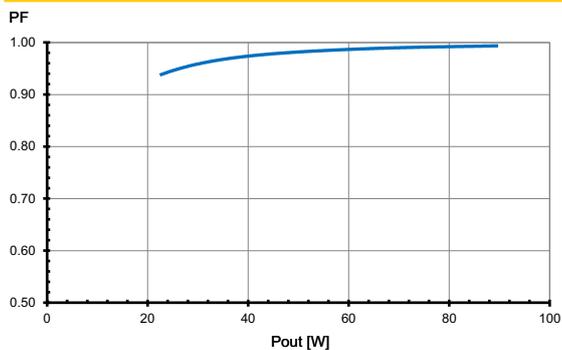
### Working area



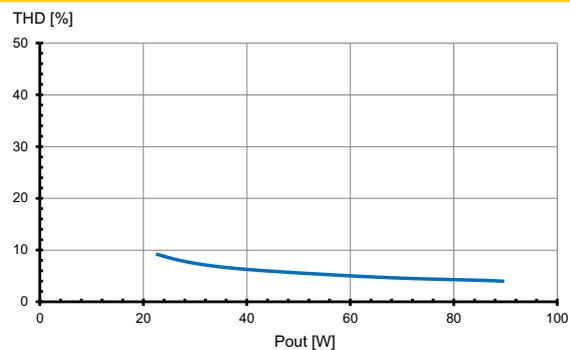
### Efficiency



### 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<sub>OUT</sub>)

According to EN 61347-1, U<sub>OUT</sub> 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<sub>OUT</sub> 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.

## PUSH function

- Just one key for dimming and ON/OFF
- Polarity- and phase-independent control
- Control input with large working voltage range
- After disconnection from the primary voltage the ballast will reproduce the last stored lighting level
- Soft start
- Automatic recognition of DALI and PUSH signals
- PUSH operating voltage ranges:
  - AC: 220–240 V ±10%
  - Failing to observe these working voltage ranges can lead to non-recognition of the signals; exceeding the maximum voltages can lead to the destruction of the data inputs.
- PUSH control signals (key activation):
  - **Short push** (80 ms < t < 500 ms): Is used to switch between ON/OFF lighting states. After the device is switched on, the last selected lighting level is restored and the next dimming direction will be downwards.
  - **Long push** (500 ms < t < 10 s): Is used to dim upwards or downwards; a long push will change the dimming direction. Thus, a long push will reverse the dimming direction until the upper or lower limit is reached. If the light was off, a long push will switch it on and the dimmer will start at the lowest light intensity.
  - **Push to synchronise** (t > 10 s): Light is dimmed to the preset factory level and the next dimming direction will be upwards.

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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

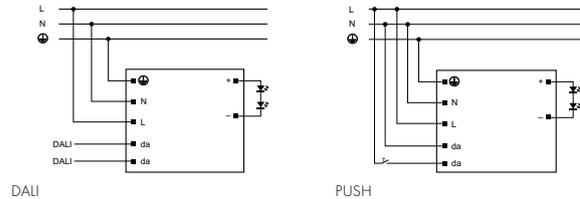
### Mechanical mounting

- 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  $\geq 4$  (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 mm<sup>2</sup>
- 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 m $\Omega$  (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
ECXd 350.628	<b>187335</b>	15	20	25	26	33	41
ECXd350.665	<b>187416</b>	13	17	21	22	28	35
ECXd 350.629	<b>187336</b>	9	11	14	15	19	24
ECXd 500.630	<b>187337</b>	12	16	19	20	26	33
ECXd 500.631	<b>187338</b>	8	11	13	14	18	22
ECXd 700.632	<b>187339</b>	8	11	13	14	18	22

- 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.

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