

CC LINEAR



PrimeLine NFC L-R1 DALI2

186852, 186853, 186854, 186855

Typical Applications

Built-in in linear luminaires for

- Office lighting
- Industrial lighting



PrimeLine NFC L-R1 DALI2

- **ADJUSTABLE OUTPUT CURRENT, CLO, DC LEVEL VIA NFC**
- **DIMMABLE: DALI (ED. 2) AND PUSH KEY**
- **VERY LOW RIPPLE CURRENT: < 1%**
- **LONG SERVICE LIFE: UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**



Primeline NFC L-R1 DALI2

Product features

- Linear casing shape

Functions

- Programmable via NFC interface (contactless)
 - Selectable current output
 - Programmable CLO function
 - Adjustable DC level

Electrical features

- Mains voltage: 220–240 V $\pm 10\%$
- Mains frequency: 50–60 Hz
- DC operation: 198–264 V, 0 Hz
- Push-in terminals: 0.2–1.5 mm²
- Power factor at full load: > 0.97
- Max. working voltage (U_{OUT}): 250 V
- Secondary side switching of LED modules is not allowed.

Dimming

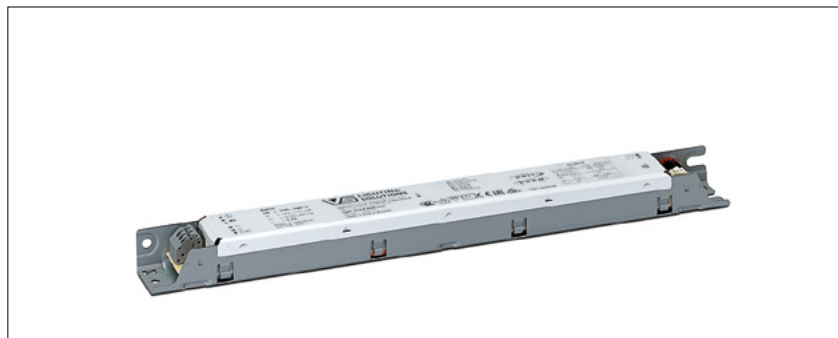
- Dimming range: 1 to 100%

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
- Overtemperature protection
- Protection against "no load" operation
- Degree of protection: IP00
- Protection class I

Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
186852	30	64	195
186853	30	64	205
186854	30	64	205
186855	30	64	205

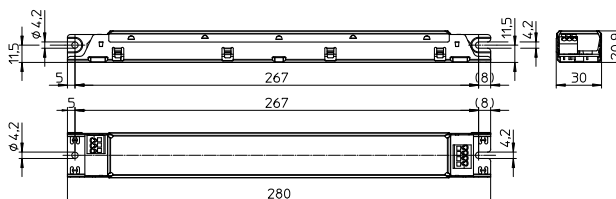


Applied standards

- EN 60598-2:22
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 61000-3-2
- EN 62384
- EN 62386 DALI Ed. 2 Part 101,102,207
- EN 50172
- EN 55015

Dimensions

- Casing: M7.1
- Length: 280 mm
- Width: 30 mm
- Height: 21 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.



Dimming

Analogue



Current adjustment



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Electrical characteristics

Max. output W	Type	Ref. No.	Voltage 50–60 Hz V	Mains current mA	Inrush current A / μ 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 %
40	ECXd 400.348	186852	220–240	205–190	31 / 205	100–400	30–120	< 15	> 90	< 1
40	ECXd 800.349	186853	220–240	210–200	35 / 250	400–800	30–70	< 13	> 89	< 1
85	ECXd 400.350	186854	220–240	410–380	31 / 205	100–400	100–225	< 9	> 94	< 1
85	ECXd 800.351	186855	220–240	425–385	35 / 250	400–800	30–130	< 9	> 93	< 1

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.		
186852	-25	+50	5	60	-40	+85	5	95	+65	IP00
186853, 186854, 186855									+70	

Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No.			
	186852	186853, 186854, 186855		
All	55 °C	65 °C	60 °C	70 °C
hrs.	100,000	50,000	100,000	50,000

Product labels

<ul style="list-style-type: none"> ■ ■ ■ da ■ da ■ PUSH 	INPUT U_N = 220...240 V I _N = 205...190 mA f _N = 0/50...60 Hz I = 0,98 Range of application DC 198...276 V	 LIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Electronic converter for LED Type ECXd 400.348 Ref.-No. 186852 Made in Serbia (Europe)	EN 61347-1 EN 61347-2-13 EN 62384 EN 61547 EN 55015 EN 61000-3-2	 Non isolated	<table border="1"> <thead> <tr> <th colspan="2">OUTPUT</th> </tr> </thead> <tbody> <tr> <td>I_{rated} (mA)</td> <td>100...400</td> </tr> <tr> <td>U_{rated} (V)</td> <td>30...120</td> </tr> <tr> <td>P_{rated} (W)</td> <td>3...40</td> </tr> <tr> <td>t_c (°C)</td> <td>65</td> </tr> <tr> <td>t_a (°C)</td> <td>-25...+50</td> </tr> <tr> <td>U_{out} (V)</td> <td><250</td> </tr> </tbody> </table>	OUTPUT		I _{rated} (mA)	100...400	U _{rated} (V)	30...120	P _{rated} (W)	3...40	t _c (°C)	65	t _a (°C)	-25...+50	U _{out} (V)	<250	LED+ ■ LED- ■
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U _{out} (V)	<250																			

<ul style="list-style-type: none"> ■ ■ ■ da ■ da ■ PUSH 	INPUT U_N = 220...240 V I _N = 210...200 mA f _N = 0/50...60 Hz I = 0,97 Range of application DC 198...276 V	 LIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Electronic converter for LED Type ECXd 800.349 Ref.-No. 186853 Made in Serbia (Europe)	EN 61347-1 EN 61347-2-13 EN 62384 EN 61547 EN 55015 EN 61000-3-2	 Non isolated	<table border="1"> <thead> <tr> <th colspan="2">OUTPUT</th> </tr> </thead> <tbody> <tr> <td>I_{rated} (mA)</td> <td>400...800</td> </tr> <tr> <td>U_{rated} (V)</td> <td>30...70</td> </tr> <tr> <td>P_{rated} (W)</td> <td>12...40</td> </tr> <tr> <td>t_c (°C)</td> <td>70</td> </tr> <tr> <td>t_a (°C)</td> <td>-25...+50</td> </tr> <tr> <td>U_{out} (V)</td> <td><250</td> </tr> </tbody> </table>	OUTPUT		I _{rated} (mA)	400...800	U _{rated} (V)	30...70	P _{rated} (W)	12...40	t _c (°C)	70	t _a (°C)	-25...+50	U _{out} (V)	<250	LED+ ■ LED- ■
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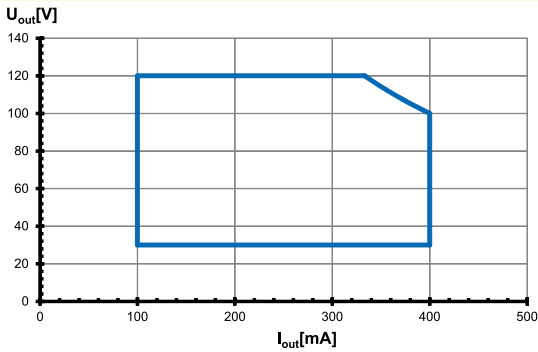
<ul style="list-style-type: none"> ■ ■ ■ da ■ da ■ PUSH 	INPUT U_N = 220...240 V I _N = 410...380 mA f _N = 0/50...60 Hz I = 0,99 Range of application DC 198...276 V	 LIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Electronic converter for LED Type ECXd 400.350 Ref.-No. 186854 Made in Serbia (Europe)	EN 61347-1 EN 61347-2-13 EN 62384 EN 61547 EN 55015 EN 61000-3-2	 Non isolated	<table border="1"> <thead> <tr> <th colspan="2">OUTPUT</th> </tr> </thead> <tbody> <tr> <td>I_{rated} (mA)</td> <td>100...400</td> </tr> <tr> <td>U_{rated} (V)</td> <td>100...225</td> </tr> <tr> <td>P_{rated} (W)</td> <td>10...85</td> </tr> <tr> <td>t_c (°C)</td> <td>70</td> </tr> <tr> <td>t_a (°C)</td> <td>-25...+50</td> </tr> <tr> <td>U_{out} (V)</td> <td><250</td> </tr> </tbody> </table>	OUTPUT		I _{rated} (mA)	100...400	U _{rated} (V)	100...225	P _{rated} (W)	10...85	t _c (°C)	70	t _a (°C)	-25...+50	U _{out} (V)	<250	LED+ ■ LED- ■
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<ul style="list-style-type: none"> ■ ■ ■ da ■ da ■ PUSH 	INPUT U_N = 220...240 V I _N = 425...385 mA f _N = 0/50...60 Hz I = 0,99 Range of application DC 198...276 V	 LIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Electronic converter for LED Type ECXd 800.351 Ref.-No. 186855 Made in Serbia (Europe)	EN 61347-1 EN 61347-2-13 EN 62384 EN 61547 EN 55015 EN 61000-3-2	 Non isolated	<table border="1"> <thead> <tr> <th colspan="2">OUTPUT</th> </tr> </thead> <tbody> <tr> <td>I_{rated} (mA)</td> <td>400...800</td> </tr> <tr> <td>U_{rated} (V)</td> <td>30...130</td> </tr> <tr> <td>P_{rated} (W)</td> <td>12...85</td> </tr> <tr> <td>t_c (°C)</td> <td>70</td> </tr> <tr> <td>t_a (°C)</td> <td>-25...+50</td> </tr> <tr> <td>U_{out} (V)</td> <td><250</td> </tr> </tbody> </table>	OUTPUT		I _{rated} (mA)	400...800	U _{rated} (V)	30...130	P _{rated} (W)	12...85	t _c (°C)	70	t _a (°C)	-25...+50	U _{out} (V)	<250	LED+ ■ LED- ■
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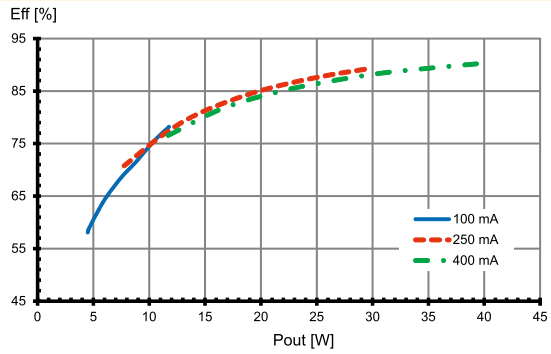
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Typ. performance graphs for 186852 / Type ECXd 400.348

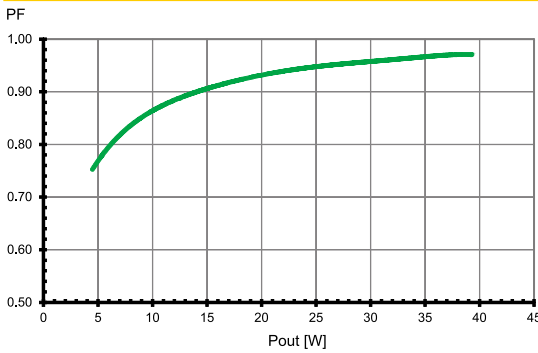
Working area



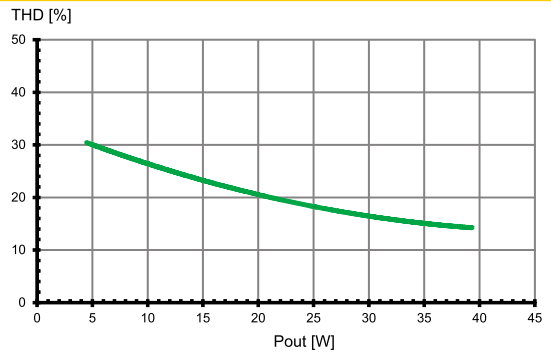
Efficiency



Power factor

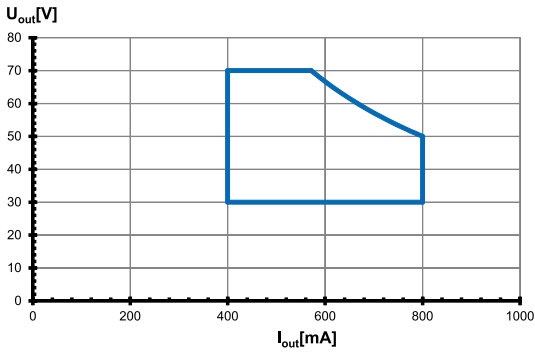


Total harmonic factor (THD)

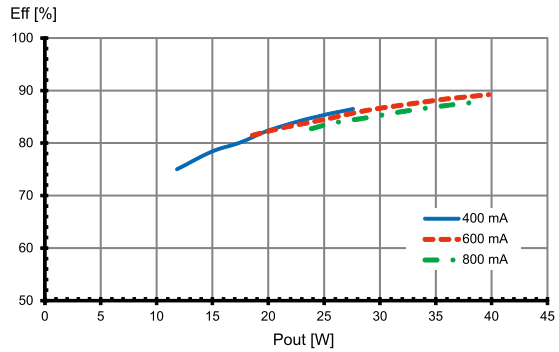


Typ. performance graphs for 186853 / Type ECXd 800.349

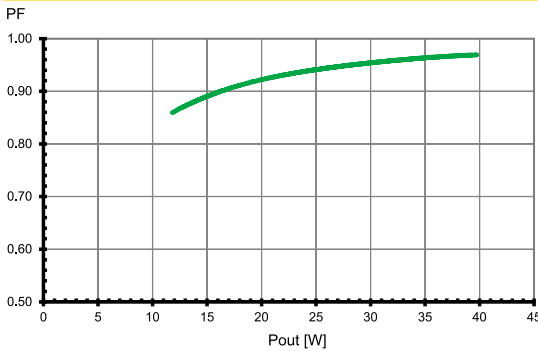
Working area



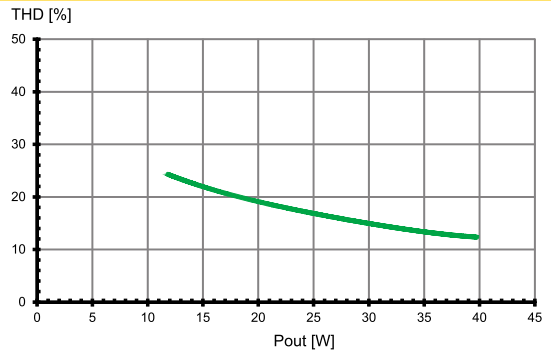
Efficiency



Power factor



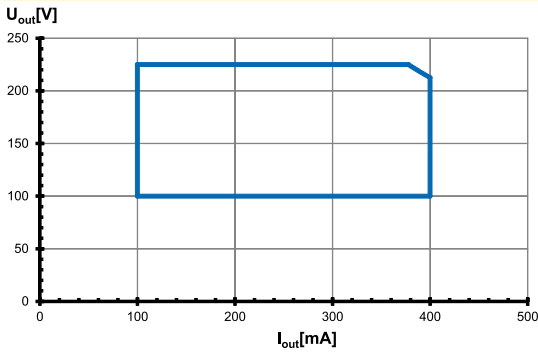
Total harmonic factor (THD)



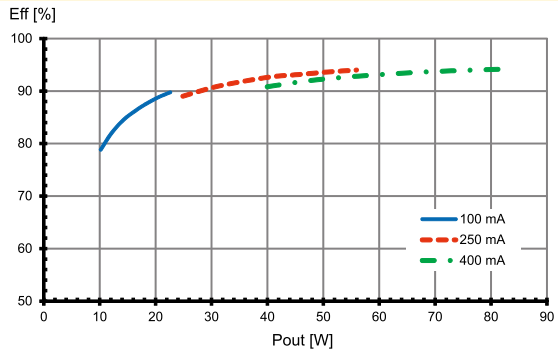
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Typ. performance graphs for 186854 / Type ECXd 400.350

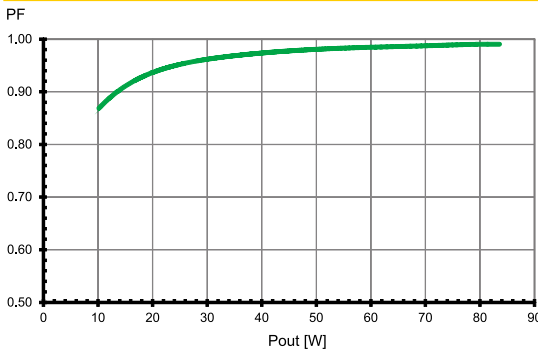
Working area



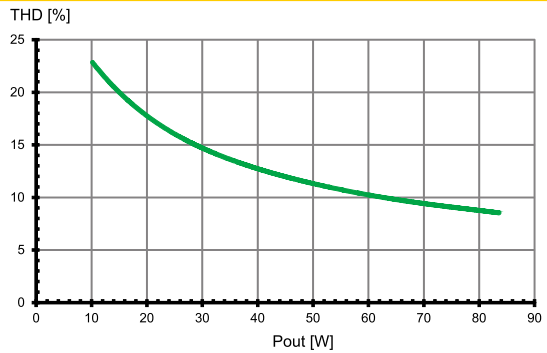
Efficiency



Power factor

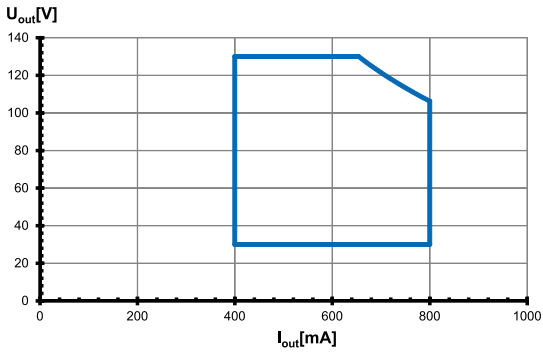


Total harmonic factor (THD)

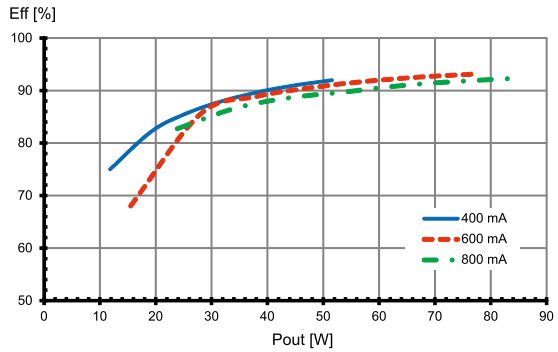


Typ. performance graphs for 186855 / Type ECXd 800.351

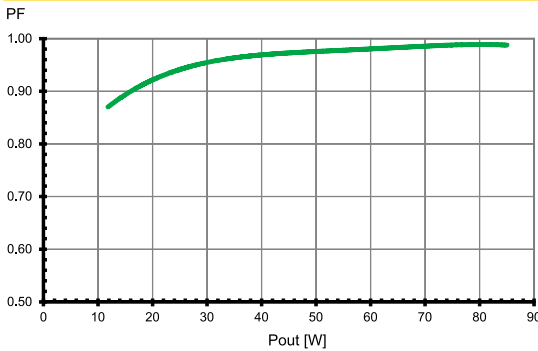
Working area



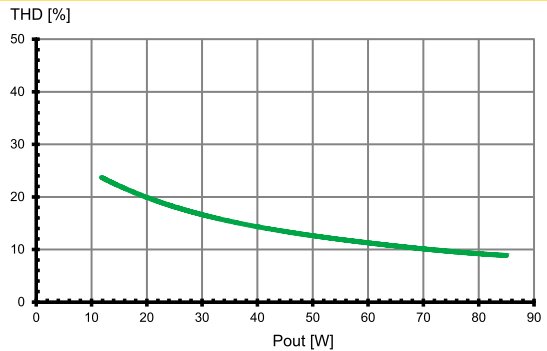
Efficiency



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 gear is protected against permanent short-circuit with automatic restart function.
- Overload protection: The control gear only works 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).
- Overheating: The control gear has overheating protection acc. to EN 61347-1 C 5e.
In case of overheating the control gear will reduce the output power.
- 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.

PUSH function

- Just one key for dimming and ON/OFF
- Polarity- and phase-independent control
- Control input with large working voltage range
- Suitable for multi-layer control
- Fully DC-compatible – no functional restrictions during DC operation (precondition: DC level is deactivated)
- 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 \pm 10%
 - DC: 198–264 V
 - 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 < 460 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 upwards.
 - **Long push** (460 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.
 - **Synchronisation**: Any 1-key dimmer that does not feature a central control module (as each ballast will have its own controls) can develop asynchronous behaviour (e.g. children might play with the key). The system will then be out of sync, i.e. some lamps will be on, others off or the dimming direction will differ from lamp to lamp.
Two methods of synchronisation can be used:
 - Push the key for more than 10 seconds, after which the light will be dimmed to a preset level and the next dimming direction will be upwards.
 - Start with a long push of the key so that all lamps are switched on. Follow with a short push to turn the system off. The system will now be resynchronised.

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Parametrization via NFC

- 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: 198–264 V
 - Reducing to 176 V: With reduced service life time possible
 - Light level at DC operation (E_{OF1}): 15% (adjustable)
 - DC level range: 0/1–100% (programmable via NFC)
 - DC operation: acc. to EN 60598-2-22 the LED current reduction at high temperature is limited to 50% to nominal current.
- Constant lumen output (CLO)
 - In the most cases the CLO function is used to reduce system performance over the life of an LED system.
 - The luminous flux of LED modules decreases in a step-wise manner up to the end of the modules' service life. To guarantee constant luminous flux, the output of the control gear must be gradually increased over its service life.
 - Defining the CLO function its needed to program the start, provisional and end value, respectively the LED lifetime via the NFC programmer.
- Current adjustment (mA)
 - Factory setting: minimum current
 - Programmable output current via NFC

System architecture – NFC configuration

- With the NFC programmer (Ref. No. 186646) and the EnOcean USBStick (Ref. No. 186563) or alternatively with a Feig Programmer or the Feig NFC antenna, contactless programming of NFC LED drivers is possible.
- The LED driver is programmed via NFC in a de-energised state.
- The use of the NFC programmer is flexible in the production or already in the pre-assembly process. A complex commissioning is not required. The operation and parameterization is done in the simplest way. All operating parameters can be individually programmed and updated.
- The exact description of the programming can be found in the operation manual of the NFC programmer.

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.



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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

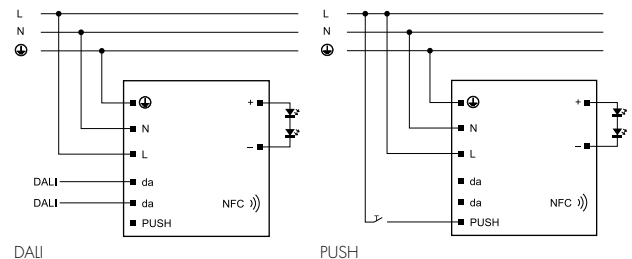
- DIN VDE 0100
- EN 60598-1

Mechanical mounting

- Mounting position: Any position inside a luminaire is allowed. LED 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: IP00
- 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

- Connection terminals: Push-in terminals for rigid or flexible conductors with a section of 0.2–1.5 mm² AWG24-16
- Stripped length: 8.5–9.5 mm
- Wiring: DALI or PUSH
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. Several LED drivers can be connected to a single PUSH button. Furthermore, several buttons can also be operated with a single PUSH system as long as the phase assignments (e.g. L1) are identical. In installations with PUSH function, an asynchronous dimming behaviour can occur. To minimize the risk, VS recommends the max. limit number of 4 LED drivers with one or more PUSH buttons. The lead length from the push button (n) to the LED driver (n) should not exceed 100 m. If more than 4 LED drivers are connected to the system, care must be taken to comply with the limitation of cable lengths. In addition, the max. number of LED drivers per circuit breaker should not be exceeded.
- 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:



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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				
		B 10 A	B 13 A	B 16 A
ECXd 400.289	186852	12	16	20
ECXd 800.290	186853	9	12	14
ECXd 400.291	186854	12	16	20
ECXd 800.292	186855	9	12	14
Automatic cut-out type C				
		C 10 A	C 13 A	C 16 A
ECXd 400.289	186852	21	27	34
ECXd 800.290	186853	15	20	24
ECXd 400.291	186854	21	27	34
ECXd 800.292	186855	15	20	24

- To limit capacitive inrush currents the current carrying capacity of each circuit breaker (fuse) can be increased by a factor of 2.5 with the help of our ESB (Ref. No.: 149820, 149821, 149822) inrush current limiters.

EU compliance information

Hereby, Vossloh-Schwabe Deutschland GmbH declares that the radio equipment type Primeline NFC L-R1 DALI2 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.vossloh-schwabe.com.

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