

CC PrimeLine NFC S-MD DALI2 Dx



PRIMELINE NFC S-MD DALI2 Dx

187352, 187353, 187354, 187355, 187409, 187410

Typical Applications

Built-in in compact luminaires

- Street lighting
- Industrial lighting



PrimeLine NFC S-MD DALI2 Dx

- **ADJUSTABLE OUTPUT CURRENT (AOC) VIA NFC**
- **DIMMABLE: DALI (ED. 2)**
- **INTEGRATED 16 V DC DALI-2 BUS POWER SUPPLY**
- **AUX POWER SUPPLY: 24 V / 125 mA**
- **MIDNIGHT FUNCTION**
- **VERY LOW RIPPLE CURRENT: < 3%**
- **SURGE PROTECTION: UP TO 10 KV**
- **COMPLIANT TO ZHAGA BOOK 13**
- **LONG SERVICE LIFE:
UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 7 YEARS**



PrimeLine NFC S-MD DALI2 Dx

Product features

- Compact casing shape

Functions

- Selectable current output via NFC interface
- Programmable via NFC interface (contactless)
 - MidNight function
 - Constant Lumen Output (CLO)

Electrical features

- Mains voltage: 220–240 V AC
- Mains frequency: 50–60 Hz
- Push-in terminals
Input (L, N, G): 0.5–2.5 mm²
Output: 0.2–1.5 mm²
Dimming: 0.2–1.0 mm²
- Power factor at full load: > 0.95
- Open circuit voltage (U_{max}):
70 V (187352), 100 V (187353), 120 V (187409)
- Max. working voltage (U_{OUT}): 140 V (187354),
200 V (187355), 260 V (187410)
- Start-up time: 1–1.5s
- Failure rate: ≤ 10%

Dimming

- Multi-Dim: DALI2, MidNight function, AC-Dim
- Dimming range: 10 to 100%
- If no dimming interface is connected, brightness will stay at 100%.

Safety features

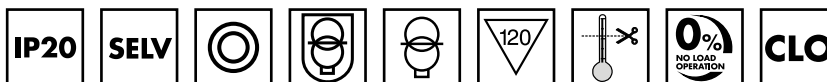
- Protection against transient main peaks up to 6 kV (between L and N) and up to 10 kV (between L/N and PE)
- Electronic short-circuit protection (SCP)
- Overtemperature protection (OTP)
- Over-voltage protection (input & output/"no load") (OVP)
- Under-voltage protection (UVP)
- Over-power protection (OPP)
- Degree of protection: IP20
- Protection class I / II

Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
187352	30	30	250
187353	30	30	500
187354	30	30	500
187355	30	30	500
187409	30	30	500
187410	18	30	1000

Product drawings and photos

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



Applied standards

- EN 61000-3-2(3)
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 62384
- EN 62493
- EN 62386-101 DALI Ed. 2, Part101,102,207
- EN 62386, Part 150, 250, 251, 252, 253
- EN 55015

Dimensions

Ref. No.	Casing	Length mm	Width mm	Height mm
187352	K72.2	132.5	77,4	40
187353				
187354				
187355				
187409				
187410	K75.2	171	101	41



Dimming

Analogue



Current adjustment



Energy & diagnostic data:

acc. DALI parts 251, 252, 253

Product guarantee

- 7 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.

LED Drivers – PrimeLine NFC S-MD DALI2 Dx

Electrical characteristics

Max. output W	Type	Ref. No.	Nominal input voltage range (50–60 Hz) V AC	Mains current mA	Inrush current A / μ 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 %
26.6	ECXd 1050.639	187352	176–305	160	43 / 300	300–1050	700	20–38	4	88.5	\leq 3
40	ECXd 1050.640	187353	176–305	220	43 / 300	300–1050	700	28–57	3	90	\leq 3
60	ECXd 1050.659	187409	176–305	320	43 / 300	300–1050	700	30–86	3	90	\leq 3
80.5	ECXd 1050.641	187354	176–305	420	55 / 300	300–1050	700	35–115	3	91.5	\leq 3
120	ECXd 1050.642	187355	176–305	600	60 / 300	300–1050	700	75–172	3	93	\leq 3
165	ECXd 1050.660	187410	176–305	840	60 / 500	300–1050	700	115–236	3	94	\leq 3

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.		
187352	–40	+55	10	80	–40	+85	5	85	+85 (t_c ,life)* +85 (t_c ,max.)*	IP20
187353									+85 (t_c ,life)* +85 (t_c ,max.)*	
187409									+85 (t_c ,life)* +85 (t_c ,max.)*	
187354									+88 (t_c ,life)* +90 (t_c ,max.)*	
187355									+86 (t_c ,life)* +90 (t_c ,max.)*	
187410	–40	+55						+85 (t_c ,life)* +90 (t_c ,max.)*		

* t_c ,life: (t_c , warranty) | t_c ,max.: (max. allowed t_c temperature)

Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No.																	
	187352			187353			187409			187354			187355			187410		
All	75 °C	80 °C	85 °C	75 °C	80 °C	85 °C	75 °C	80 °C	85 °C	75 °C	88 °C	90 °C	75 °C	86 °C	90 °C	75 °C	85 °C	90 °C
hrs.	100,000	80,000	50,000	100,000	74,000	50,000	100,000	70,000	50,000	100,000	50,000	45,000	100,000	50,000	38,000	100,000	50,000	38,000

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LED Drivers – Primeline NFC S-MD DALI2 Dx

Product labels

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

SEC
VSL LIGHTING SOLUTIONS
 Vossloh-Schwabe Deutschland GmbH
 Stuttgarter Straße 61/1, 73614 Schorndorf
 Electronic Converter for LED
Type ECXd 1050.639
 Ref.-No. 187352
 Made in China

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Bottom side
 $t_c = 85^\circ\text{C}$
 23 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	20...38
P _{rated} [W]	26
t _a [°C]	-40...55
U _{max} [V]	70
λ	0.65C - 0.97

PRI
Un=220...240V~
 I_{N,max}=160 mA
 f_N=50/60 Hz

RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

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 EN 61000-3-2
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 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Bottom side
 $t_c = 85^\circ\text{C}$
 23 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	28...57
P _{rated} [W]	40
t _a [°C]	-40...55
U _{max} [V]	100
λ	0.7C - 0.98

PRI
Un=220...240V~
 I_{N,max}=220 mA
 f_N=50/60 Hz

RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

SEC
VSL LIGHTING SOLUTIONS
 Vossloh-Schwabe Deutschland GmbH
 Stuttgarter Straße 61/1, 73614 Schorndorf
 Electronic Converter for LED
Type ECXd 1050.659
 Ref.-No. 187409
 Made in China

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Bottom side
 $t_c = 85^\circ\text{C}$
 23 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	38...86
P _{rated} [W]	60
t _a [°C]	-40...55
U _{max} [V]	120
λ	0.75C - 0.98

PRI
Un=220...240V~
 I_{N,max}=320 mA
 f_N=50/60 Hz

RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

SEC
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 Electronic Converter for LED
Type ECXd 1050.641
 Ref.-No. 187354
 Made in China

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Bottom side
 $t_c = 90^\circ\text{C}$
 15 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	35...115
P _{rated} [W]	80
t _a [°C]	-40...55
U _{max} [V]	140
λ	0.6C - 0.98

PRI
Un=220...240V~
 I_{N,max}=420 mA
 f_N=50/60 Hz

RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

SEC
VSL LIGHTING SOLUTIONS
 Vossloh-Schwabe Deutschland GmbH
 Stuttgarter Straße 61/1, 73614 Schorndorf
 Electronic Converter for LED
Type ECXd 1050.642
 Ref.-No. 187355
 Made in China

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Bottom side
 $t_c = 90^\circ\text{C}$
 15 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	75...172
P _{rated} [W]	120
t _a [°C]	-40...50
U _{max} [V]	200
λ	0.72C - 0.98

PRI
Un=220...240V~
 I_{N,max}=600 mA
 f_N=50/60 Hz

RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

DA+
DA-
24V-
24V+
NTC+
NTC-
LED+
LED-

SEC
VSL LIGHTING SOLUTIONS
 Vossloh-Schwabe Deutschland GmbH
 Stuttgarter Straße 61/1, 73614 Schorndorf
 Electronic Converter for LED
Type ECXd 1050.660
 Ref.-No. 187410
 Made in China

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61547
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 62493

Top side
 $t_c = 90^\circ\text{C}$
 20 mm
 40 mm
SELV

OUTPUT	
I _{rated} [mA]	300...1050
U _{rated} [V]	115...236
P _{rated} [W]	165
t _a [°C]	-40...50
U _{max} [V]	260
λ	0.79C - 0.98

PRI
Un=220...240V~
 I_{N,max}=840 mA
 f_N=50/60 Hz

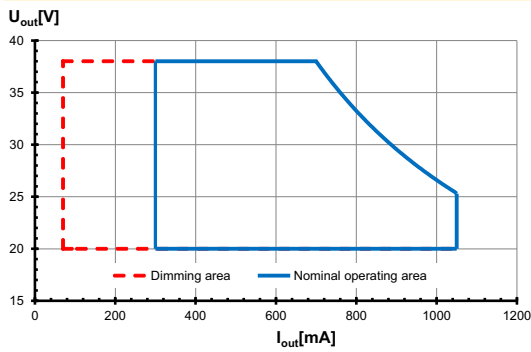
RoHS
 CE UK CA EAC

Suitable for class I/II luminaires

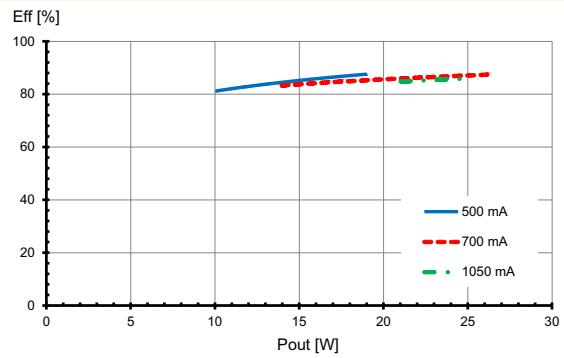
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Typ. performance graphs for 187352 / Type ECXd 1050.639

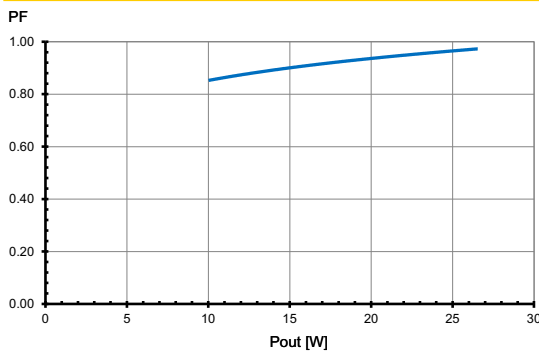
Working area



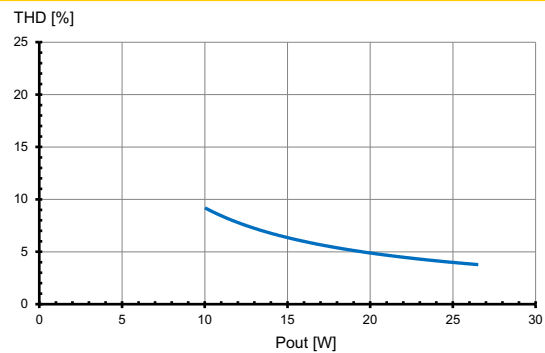
Efficiency



Power factor

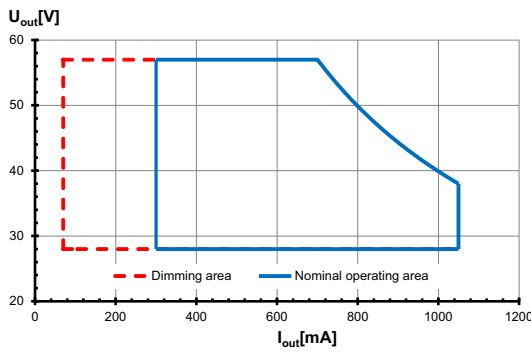


Total harmonic factor (THD)

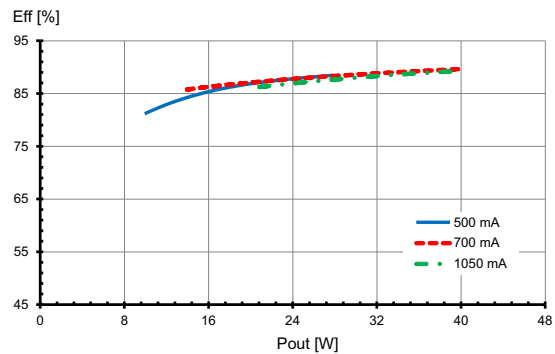


Typ. performance graphs for 187353 / Type ECXd 1050.640

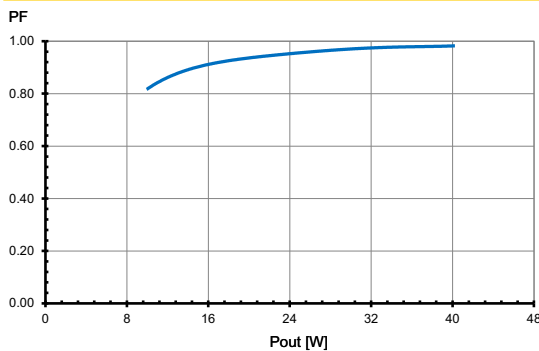
Working area



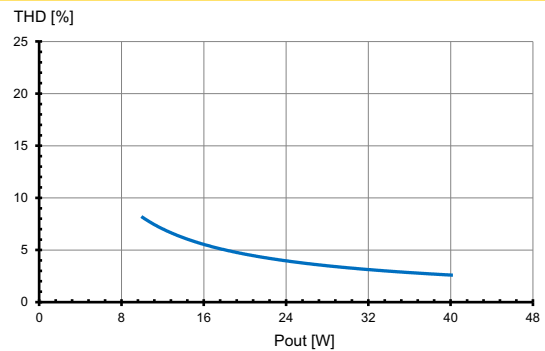
Efficiency



Power factor



Total harmonic factor (THD)

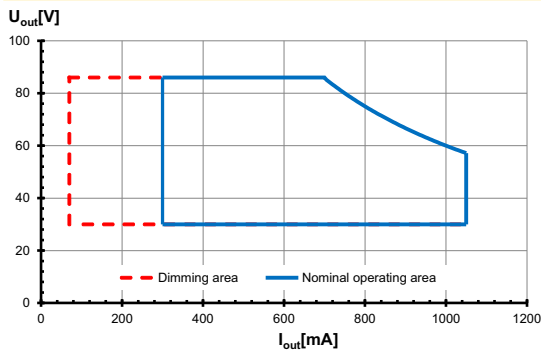


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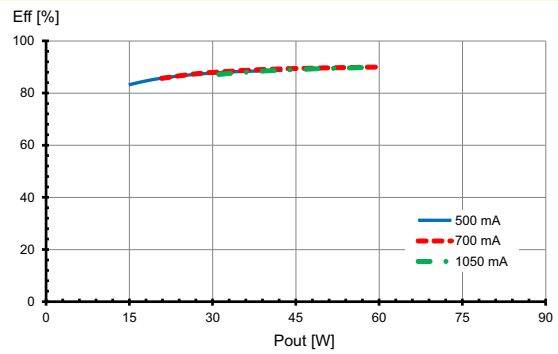
LED Drivers – Primeline NFC S-MD DALI2 Dx

Typ. performance graphs for 187409 / Type ECXd 1050.659

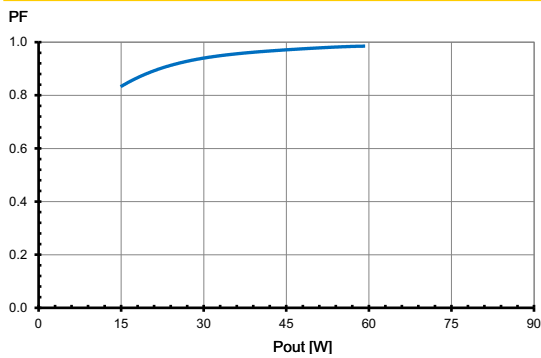
Working area



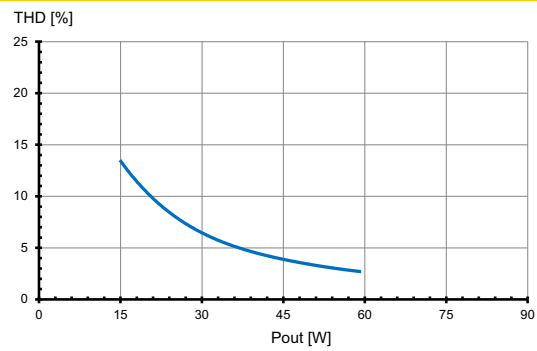
Efficiency



Power factor

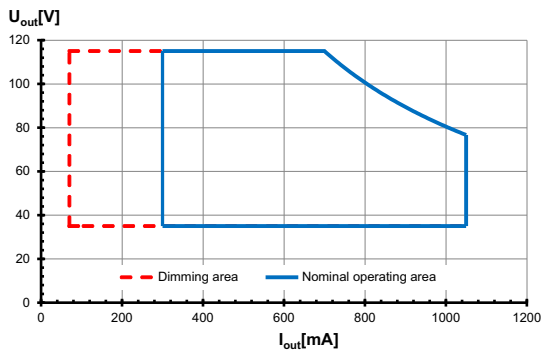


Total harmonic factor (THD)

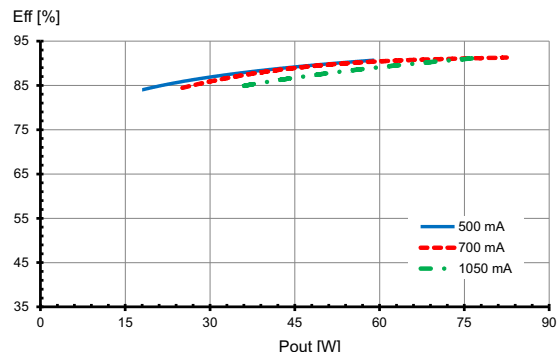


Typ. performance graphs for 187354 / Type ECXd 1050.641

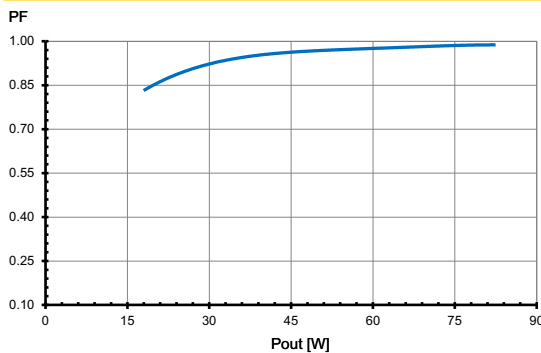
Working area



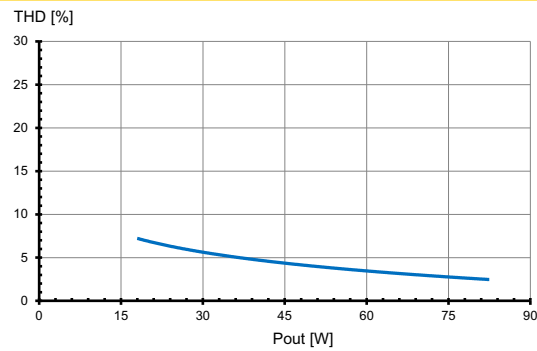
Efficiency



Power factor



Total harmonic factor (THD)

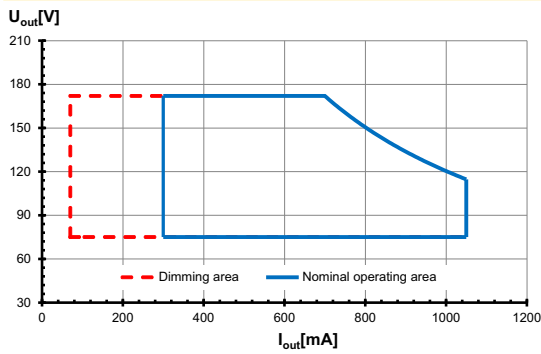


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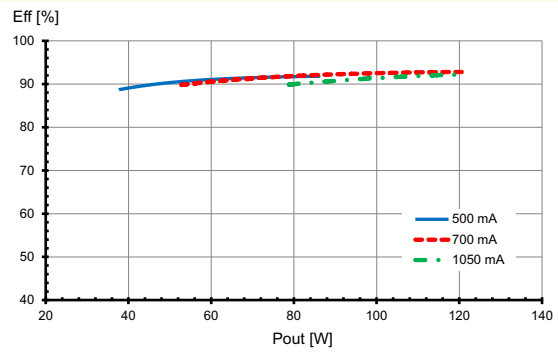
LED Drivers – Primeline NFC S-MD DALI2 Dx

Typ. performance graphs for 187355 / Type ECXd 1050.642

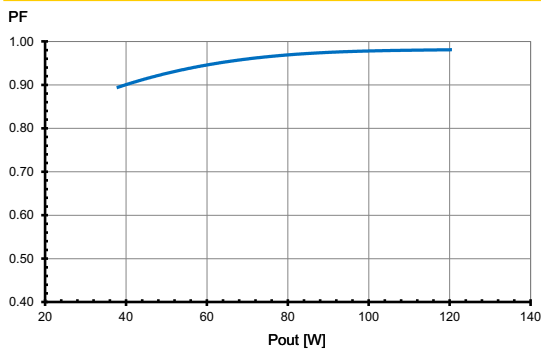
Working area



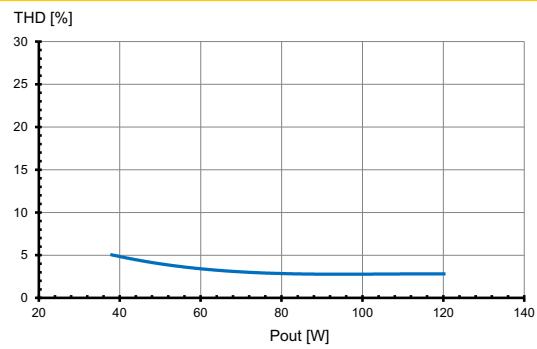
Efficiency



Power factor

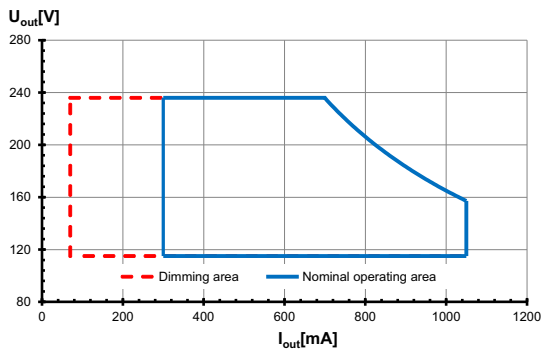


Total harmonic factor (THD)

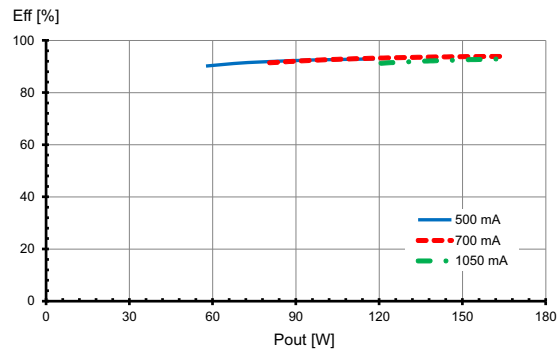


Typ. performance graphs for 187410 / Type ECXd 1050.660

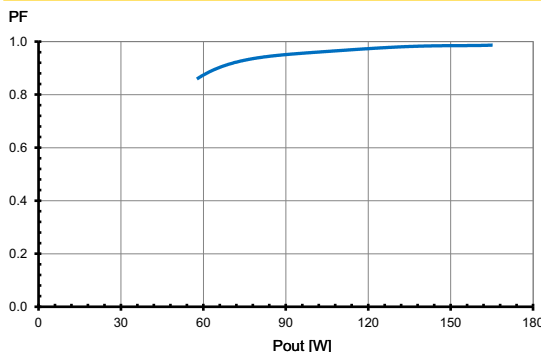
Working area



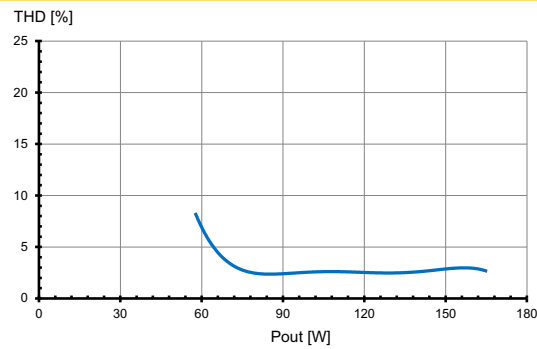
Efficiency



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 6 kV
Surges 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.
- Input over- & undervoltage:
The control gear is protected against over-voltage or undervoltage coming from mains.
The undervoltage range covered:
UIN 130 ... 176 Vac.
The overvoltage range covered:
UIN 305 ... 345 Vac
- 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.

NTC for thermal protection of the LED module

The LEDs can be thermally protected by the NTC interface (Negative Temperature Coefficient Resistor) of the operating device, which ensures the current will be reduced when a critical temperature is reached. Any arbitrary NTC can be configured via NFC interface. Connect an NTC to the LED module connectors which are connected with the LED driver as shown in the wiring diagram.

- Max. NTC resistor: 100 kΩ, (10 kΩ)
- Start of output current reduction: 20 kΩ, (2,6 kΩ)
- End of output current reduction: 10,3 kΩ, (1,5 kΩ)
- NTC: 100 kOHM, B value: 4050; 10 kOHM, NTC B value: 3380 - Tolerance: ±2 ; other NTC - Tolerance ±5 .

Dimming

- Min. output current load: 10 % for I_{set} ≥ 700 mA
70 mA for I_{set} < 700 mA
- Dimming current tolerance: ± 3 % of the adjusted output current

DALI2

In this operating mode, the driver can be controlled in a DALI application via the bidirectional DALI interface. Application control allows the driver to be integrated into a light management system. The drivers are DALI2 certified and support stepless dimming, status queries and addressing of each individual luminaire. Compared to devices based on the DALI1 version, DALI2-based drivers provide more functions and higher interoperability in the system.

MidNight function

Automatic dimming via an integrated timer (no real-time clock). Five independent dimming levels and zones can be set using the configurator software.

AC-Dim

Dimming by reducing the mains voltage amplitude. More details can be found in the appropriate technical application guide.

Constant lumen output (CLO)

The decrease in the luminous flux of an LED module can be compensated over its entire lifetime via a preprogrammed current curve. This not only ensures stable lighting but also saves energy and increases the lifetime of the LEDs.

Energy metering (DALI Part 252)

Accuracy 0.5W at standby; +/-1 % at full power

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LED Drivers – Primeline NFC S-MD DALI2 Dx

DALI / AUX Specifications

Parameter	Min.	Typ.	Max.	Notes
24V Auxiliary Output Voltage	21.6 V	24 V	26.4 V	Pload > 0.1W
24V Auxiliary Output Current	0 mA	-	125 mA	Auxiliary supply Vaux supplies 24 V DC and is able to deliver 3 W average power. Peak power capacity is 10 W with 25 % duty cycle (T = 5.2 ms)
24V Auxiliary Repetitive Peak Current @6W pulsed output power	-	-	250 mA	250 mA peak for max. duration of 2.2 ms in a 6.0 ms period during which time the average should not exceed 125 mA.
24V Auxiliary Repetitive Peak Current @10W pulsed output power	-	-	425 mA	425 mA peak for max. duration of 1.3 ms in a 5.2 ms period during which time the average should not exceed 125 mA.
Integrated DALI-2 Bus Power Supply Voltage	12 V	16 V	20 V	Voltage is depending on loading and will vary between 12 V–20 V DC
Integrated DALI-2 Bus Power Supply Current	50 mA	-	60 mA	
DALI-2 (High Voltage Level)	9.5 V	16 V	22.5 V	
DALI-2 (Low Voltage Level)	-6.5 V	0 V	6.5 V	
DALI-2 (Dimming Output Range)	10 %	-	100 %	Iset = 0.7...1.05A
DALI-2 (Sink Current)	-	-	2.0 mA	

Important Notes:

[1] DALI-2 bus power supply is enabled by factory default and can be switched off through the LED configurer software interface..

[2] The DALI-2 bus power supply and the 24V auxiliary source share the common negative terminal. The 24V auxiliary source can be used either in stand alone mode or share the negative pole with the DALI line.

[3] Do not connect multiple 24V auxiliary power supplies in parallel.

System architecture

- You can program the LED drivers contactless via a NFC Feig programmer or wired via the iProgrammer Streetlight DALI controller (Ref.No.187412).Successfully tested NFC programmers are the FEIG PRH101 and the FEIG CPR30
- The LED driver is programmed 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. Nearly all operating parameters can be individually programmed and updated. A few limited settings can only be set or read out by the use of the iProgrammer Streetlight DALI controller (Ref.No. 187412). More details to be found in the associated application guide.
- The exact description of the programming can be found in the application guide of the VS LED Configurer Tool.



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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

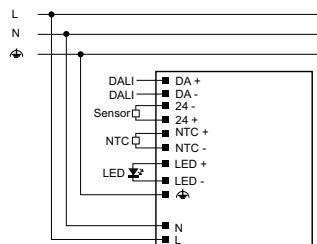
Mechanical mounting

- Mounting position: Built-in: Any position inside a luminaire is allowed
- 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
- Tightening torque: 0.2 Nm

Electrical installation

- Connection terminals: Push-in terminals for rigid or flexible conductors with a section of 0.5–2.5 mm² on input side and 0.2–1.5 mm² on output side; (dimming: 0.2–1.0 mm²).
- Stripped length: 8.5–9.5 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.
- Max. cable length: 1.5 m
- 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 m Ω (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 1050.639	187352	6	8	9
ECXd 1050.640	187353	6	8	9
ECXd 1050.659	187409	6	8	9
ECXd 1050.641	187354	4	6	7
ECXd 1050.642	187355	4	5	7
ECXd 1050.660	187410	2	3	4
Automatic cut-out type C				
		C 10 A	C 13 A	C 16 A
ECXd 1050.639	187352	10	13	16
ECXd 1050.640	187353	10	13	16
ECXd 1050.659	187409	10	13	16
ECXd 1050.641	187354	8	10	12
ECXd 1050.642	187355	7	9	11
ECXd 1050.660	187410	4	5	6

- 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 S-MD DALI2 Dx 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.

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