## CC PrimeLine NFC S-MD DAL 2 Dx



## PRIMELINE NFC S-MD DALI2 Dx

187352, 187353, 187354, 187355, 187409, 187410

## Typical Applications

Built-in in compact luminaires

- Street lighting
- Industrial lighting

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NFC) )

## DALI

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 <br> 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: $50-60 \mathrm{~Hz}$
- Push-in terminals Input (L, N, G): ) 0.5-2.5 mm²
Output: 0.2-1.5 mm ${ }^{2}$
Dimming: 0.2-1.0 mm²
- Power factor at full load: >0.95
- Open circuit voltage ( $\mathrm{U}_{\text {max. }}$ ): 70 V (187352), 100 V (187353), 120 V (187409)
- Max. working voltage (Uout): 140 V (187354), 200 V (187355), 260 V (187410)
- Start-up time: 1-1.5s
- Failure rate: $\leq 10 \%$


## 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 <br> 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.

- 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 <br> mm | Width <br> mm | Height <br> mm |
| :--- | :--- | :--- | :--- | :--- |
| 187352 | K72.2 | 132.5 | 77,4 | 40 |
| 187353 |  |  |  |  |
| 187354 |  | 171 | 101 | 41 |
| 187355 |  |  |  |  |

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## Dimming

Analogue


Current adjustment
NFC) )

## 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

K72.2


K75.2


## Tc-Point Position

187352,187353,187409



187410
see drawing K75.2 above

## LED Drivers - PrimeLine NFC S-MD DALI2 Dx

## Electrical characteristics

| Max. output W | Type | Ref. No. | Nominal input voltage range $(50-60 \mathrm{~Hz}) \vee \mathrm{AC}$ | Mains <br> current <br> mA | Inrush <br> current <br> A/ $\mu \mathrm{s}$ | Current <br> output DC $\mathrm{mA}( \pm 5 \%)$ | Factory <br> settings <br> mA | Voltage <br> output <br> DC (V) | THD <br> at full load $\%(230 \mathrm{~V})$ | Efficiency <br> at full load $\%(230 \mathrm{~V})$ | Ripple <br> 100 Hz <br> \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 ${ }^{\circ} \mathrm{C}$ min. ${ }^{\circ} \mathrm{C}$ max. |  | Operation humidity range \% min. \% max. |  | Storage temperature range ${ }^{\circ} \mathrm{C}$ min. ${ }^{\circ} \mathrm{C}$ max. |  | Storage humidity range <br> \% min. <br> \% max. |  | Max. operation temperature at $t_{c}$ point ${ }^{\circ} \mathrm{C}$ | Degree of protection |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 187352 | -40 | +55 | 10 | 80 | -40 | +85 | 5 | 85 | +85 (tc, life)* \| +85 (tc, max.)* | IP20 |
| 187353 |  |  |  |  |  |  |  |  | +85 (tc, life)* \| +85 (tc, max.)* |  |
| 187409 |  |  |  |  |  |  |  |  | +85 (tc, life)* \| +85 (tc, max.)* |  |
| 187354 |  |  |  |  |  |  |  |  | +88 (tc, life)* \| +90 (tc, max.)* |  |
| 187355 | -40 | +50 |  |  |  |  |  |  | +86 (tc, life)* \| +90 (tc, max.)* |  |
| 187410 | -40 | +55 |  |  |  |  |  |  | +85 (tc, life)* \| +90 (tc, max.)* |  |

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

## Expected service life time

at operation temperatures at $t_{c}$ point

| Operation current | $\begin{aligned} & \hline \text { Ref. No. } \\ & 187352 \\ & \hline \end{aligned}$ |  |  | 187353 |  |  | 187409 |  |  | 187354 |  |  | 187355 |  |  | 187410 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| All | $75^{\circ} \mathrm{C}$ | $80^{\circ} \mathrm{C}$ | $85^{\circ} \mathrm{C}$ | $75^{\circ} \mathrm{C}$ | $80^{\circ} \mathrm{C}$ | $85^{\circ} \mathrm{C}$ | $75^{\circ} \mathrm{C}$ | $80^{\circ} \mathrm{C}$ | $85^{\circ} \mathrm{C}$ | $75^{\circ} \mathrm{C}$ | $88^{\circ} \mathrm{C}$ | $90^{\circ} \mathrm{C}$ | $75^{\circ} \mathrm{C}$ | $86^{\circ} \mathrm{C}$ | $90^{\circ} \mathrm{C}$ | $75^{\circ} \mathrm{C}$ | $85^{\circ} \mathrm{C}$ | $90^{\circ} \mathrm{C}$ |
| 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 |

## Product labels




Typ. performance graphs for 187352 / Type ECXd 1050.639


Typ. performance graphs for 187353 / Type ECXd 1050.640


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

## LED Drivers - PrimeLine NFC S-MD DALI2 Dx

## Typ. performance graphs for 187409 / Type ECXd 1050.659




Total harmonic factor (THD) THD [\%]


Typ. performance graphs for 187354 / Type ECXd 1050.641


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## Typ. performance graphs for 187355 / Type ECXd 1050.642



Typ. performance graphs for 187410 / Type ECXd 1050.660


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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 overvoltage or undervoltage comming 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 (UOUT)

According to EN 61347-1, Uout 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 Uout 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: $100 \mathrm{k} \Omega$,(10 k $\Omega$ )
- Start of output current reduction: $20 \mathrm{k} \Omega,(2,6 \mathrm{k} \Omega)$
- End of output current reduction: $10,3 \mathrm{k} \Omega$, $(1,5 \mathrm{k} \Omega)$
- NTC: 100 kOHM, B value: 4050; 10 kOHM, NTC B value: 3380 Tolerance: $\pm 2$; other NTC - Tolerance $\pm 5$.


## Dimming

- Min. output current load: $10 \%$ for Iset $\geq 700 \mathrm{~mA}$

70 mA for Iset $<700 \mathrm{~mA}$

- Dimming current
tolerance: $\quad \pm 3 \%$ 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 DALII 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

## LED Drivers - PrimeLine NFC S-MD DALI2 Dx

DALI / AUX Specifications

| Parameter | Min. | Typ. | Max. | Notes |
| :---: | :---: | :---: | :---: | :---: |
| 24 V Auxilary Output Voltage | 21.6 V | 24 V | 26.4 V | Pload > 0.1W |
| 24V Auxilary 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 ( $T=5.2 \mathrm{~ms}$ ) |
| 24 V Auxilary 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 . |
| 24 V Auxilary 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 | OV | 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 24 V auxilary source share the common negative
terminal. The 24 V auxilary source can be used either in stand alone mode or share the negative
pole with the DALI line
[3] Do not connect multiple 24 V auxilary 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 limitted 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.


NFC S-MD Dx LED Drivers

Feig Programmer, hand-held device FEIGPRH101, FEIGCPR30

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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 $\geq 4$ (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
- Tightening torque: 0.2 Nm


## Electrical installation

- Connection
terminals:
- Stripped length:
- Wiring:
- Max. cable length:
- Polarity:
- Through-wiring:
- Secondary load:

Push-in terminals for rigid or flexible conductors with a section of $0.5-2.5 \mathrm{~mm}^{2}$ on input side and $0.2-1.5 \mathrm{~mm}^{2}$ on output side; (dimming: $0.2-1.0 \mathrm{~mm}^{2}$ ).
$8.5-9.5 \mathrm{~mm}$
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.

## 1.5 m

Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
Is not allowed.
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.

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- 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 $400 \mathrm{~m} \Omega$ (approx. 20 m [ $2.5 \mathrm{~mm}^{2}$ ] of conductor from the power supply to the distributor and a further 15 m to the luminaire).

| Type | Ref. No. | putomatic cut-out type and <br> possible no. of VS drivers <br> pcs. |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Automatic cut-out type B | B 10 A | B 13 A | B 16 A |  |
| ECXd 1050.639 | $\mathbf{1 8 7 3 5 2}$ | 6 | 8 | 9 |
| ECXd 1050.640 | $\mathbf{1 8 7 3 5 3}$ | 6 | 8 | 9 |
| ECXd 1050.659 | $\mathbf{1 8 7 4 0 9}$ | 6 | 8 | 9 |
| ECXd 1050.641 | $\mathbf{1 8 7 3 5 4}$ | 4 | 6 | 7 |
| ECXd 1050.642 | $\mathbf{1 8 7 3 5 5}$ | 4 | 5 | 7 |
| ECXd 1050.660 | $\mathbf{1 8 7 4 1 0}$ | 2 | 3 | 4 |
| Automatic cut-out type C | C 10 A | C 13 A | C 16 A |  |
| ECXd 1050.639 | $\mathbf{1 8 7 3 5 2}$ | 10 | 13 | 16 |
| ECXd 1050.640 | $\mathbf{1 8 7 3 5 3}$ | 10 | 13 | 16 |
| ECXd 1050.659 | $\mathbf{1 8 7 4 0 9}$ | 10 | 13 | 16 |
| ECXd 1050.641 | $\mathbf{1 8 7 3 5 4}$ | 8 | 10 | 12 |
| ECXd 1050.642 | $\mathbf{1 8 7 3 5 5}$ | 7 | 9 | 11 |
| ECXd 1050.660 | $\mathbf{1 8 7 4 1 0}$ | 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.

