

# ComfortLine Prog S 1-10 V MidNight



## COMFORTLINE PROG S 1-10 V MIDNIGHT

187464, 187465, 187466, 187467

### Typical Applications

Built-in in compact luminaires

- Street lighting
- Industrial lighting

1-10V
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### ComfortLine Prog S 1-10 V MidNight

- **SELECTABLE OUTPUT CURRENT VIA OFFLINE PROGRAMMING**
- **DIMMABLE: 1-10 V**
- **MIDNIGHT-FUNCTION**
- **VERY LOW RIPPLE CURRENT: < 3 %**
- **SURGE PROTECTION: UP TO 6 KV**
- **LONG SERVICE LIFE:  
UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**



## ComfortLine Prog S 1-10 V MidNight

### Product features

- Compact casing shape

### Functions

- Selectable current output via Offline programming
- Programmable via USB interface
  - MidNight function
  - Constant Lumen Output (CLO)

### Electrical features

- Mains voltage: 176-305 V AC
- Mains frequency: 50–60 Hz
- Push-in terminals
  - Input (L, N, G): 0.5–2.5 mm<sup>2</sup>
  - Output: 0.2–1.5 mm<sup>2</sup>
  - Dimming: 0.2–1.5 mm<sup>2</sup>
- Power factor at full load: > 0.96
- Open circuit voltage (U<sub>max</sub>): 85 V (187464)  
Max. working voltage (U<sub>OUT</sub>): 160 V (187465),  
260 V (187466), 320 V (187467)
- Secondary side switching of LED modules is not allowed.

### Dimming

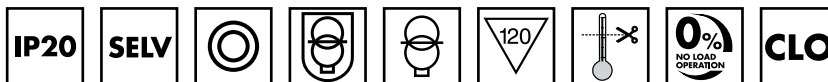
- Dimming: 1–10 V
- Dimming range: 10 to 100%
- MidNight function

### Safety features

- Protection against transient main peaks up to 4 kV (between L and N) and up to 6 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
187464	30	30	250
187465	30	30	500
187466	30	30	500
187467	18	30	1000



187464 187465, 187466, 187467



### Applied standards

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

### Dimensions

Ref. No.	Casing	Length mm	Width mm	Height mm
187464	K72.2	132.5	77,4	40
187465				
187466				
187467	K75.2	171	101	41



### Dimming

1-10V
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### Current adjustment



### Product guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage.  
(www.vossloh-schwabe.com)  
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.

**K72.2**



# LED Drivers – ComfortLine Prog S 1-10 V MidNight

## Electrical characteristics

Max. output W	Type	Ref. No.	Nominal input voltage range (50–60 Hz) V AC	Mains current mA	Inrush current A / $\mu$ s	Current output DC mA ( $\pm$ 5%)	Factory settings mA	Voltage output DC (V)	THD at full load % (230 V)	Efficiency at full load % (230 V)	Ripple 100 Hz %
40	ECXd 1050.682	<b>187464</b>	176–305	220	43 / 300	110–1050	700	24–60	3	89	$\leq$ 3
80	ECXd 1050.683	<b>187465</b>	176–305	420	55 / 300	110–1050	700	35–120	3	91	$\leq$ 3
120	ECXd 1050.684	<b>187466</b>	176–305	600	60 / 300	110–1050	700	75–220	3	92	$\leq$ 3
165	ECXd 1050.685	<b>187467</b>	176–305	840	60 / 500	110–1050	700	115–270	3	93	$\leq$ 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.		
187464	–40	+55	10	80	–40	+85	5	85	+85 ( $t_c$ ,life)*   +85 ( $t_c$ ,max.)*	IP20
187465									+85 ( $t_c$ ,life)*   +90 ( $t_c$ ,max.)*	
187466	–40	+50							+85 ( $t_c$ ,life)*   +90 ( $t_c$ ,max.)*	
187467									+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. 187464			187465			187466			187467		
All	75 °C	80 °C	85 °C	75 °C	85 °C	90 °C	75 °C	85 °C	90 °C	75 °C	85 °C	90 °C
hrs.	100.000	74.000	50.000	100.000	50.000	45.000	100.000	50.000	38.000	100.000	50.000	38.000

## Product labels

■ 1-10 V +

■ 1-10 V –

■ LED +

■ LED –

**SEC**  
**VSL LIGHTING SOLUTIONS**  
Vossloh-Schwabe Deutschland GmbH  
Stuttgarter Straße 61/1, 73614 Schorndorf  
Electronic Converter for LED  
Type ECXd 1050.682  
Ref.-No. 187464  
Made in China

**OUTPUT**  

I <sub>rated</sub> (mA)	110...1050
U <sub>rated</sub> (V)	24...60
P <sub>rated</sub> (W)	40
t <sub>a</sub> (°C)	–40...55
U <sub>o,max</sub> (V)	100
$\lambda$	0.70C...0.97

Bottom side

$t_c = 85^\circ\text{C}$

15 mm

10 mm

**PRI**  
**UN = 220...240 V ~**  
I<sub>N,max</sub> = 300 mA  
f<sub>N</sub> = 50/60 Hz

RoHS

25

120

CE

UK

ERL

■ 1-10 V +

■ 1-10 V –

■ LED +

■ LED –

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Electronic Converter for LED  
Type ECXd 1050.683  
Ref.-No. 187465  
Made in China

**OUTPUT**  

I <sub>rated</sub> (mA)	110...1050
U <sub>rated</sub> (V)	35...120
P <sub>rated</sub> (W)	80
t <sub>a</sub> (°C)	–40...55
U <sub>o,max</sub> (V)	160
$\lambda$	0.60C...0.98

Bottom side

$t_c = 90^\circ\text{C}$

30 mm

60 mm

**PRI**  
**UN = 220...240 V ~**  
I<sub>N,max</sub> = 650 mA  
f<sub>N</sub> = 50/60 Hz

RoHS

25

120

CE

UK

ERL

■ 1-10 V +

■ 1-10 V –

■ LED +

■ LED –

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Electronic Converter for LED  
Type ECXd 1050.684  
Ref.-No. 187466  
Made in China

**OUTPUT**  

I <sub>rated</sub> (mA)	110...1050
U <sub>rated</sub> (V)	75...220
P <sub>rated</sub> (W)	120
t <sub>a</sub> (°C)	–40...50
U <sub>o,max</sub> (V)	260
$\lambda$	0.72C...0.98

Bottom side

$t_c = 90^\circ\text{C}$

30 mm

60 mm

**PRI**  
**UN = 220...240 V ~**  
I<sub>N,max</sub> = 1000 mA  
f<sub>N</sub> = 50/60 Hz

RoHS

25

120

CE

UK

ERL

■ 1-10 V +

■ 1-10 V –

■ LED +

■ LED –

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Electronic Converter for LED  
Type ECXd 1050.685  
Ref.-No. 187467  
Made in China

**OUTPUT**  

I <sub>rated</sub> (mA)	110...1050
U <sub>rated</sub> (V)	115...270
P <sub>rated</sub> (W)	165
t <sub>a</sub> (°C)	–40...50
U <sub>o,max</sub> (V)	320
$\lambda$	0.79C...0.98

Top side

$t_c = 90^\circ\text{C}$

20 mm

40 mm

**PRI**  
**UN = 220...240 V ~**  
I<sub>N,max</sub> = 1300 mA  
f<sub>N</sub> = 50/60 Hz

RoHS

25

120

CE

UK

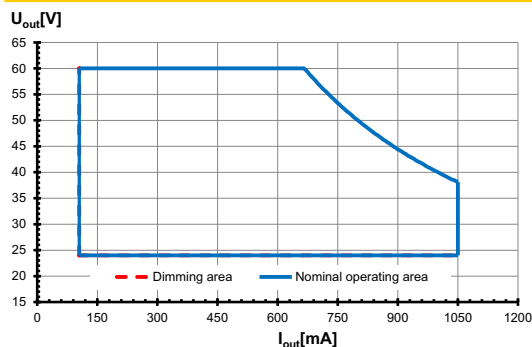
ERL

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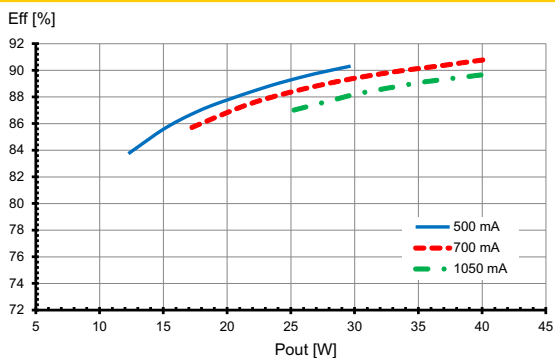
# LED Drivers – ComfortLine Prog S 1-10 V MidNight

## Typ. performance graphs for 187464 / Type ECXd 1050.682

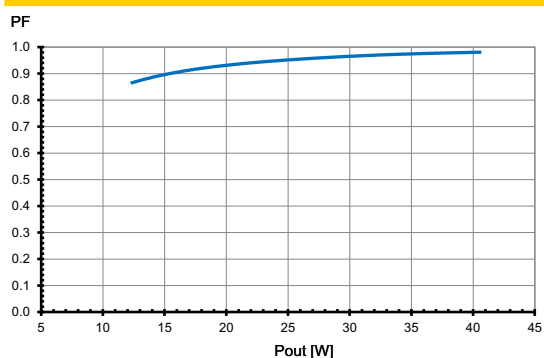
### Working area



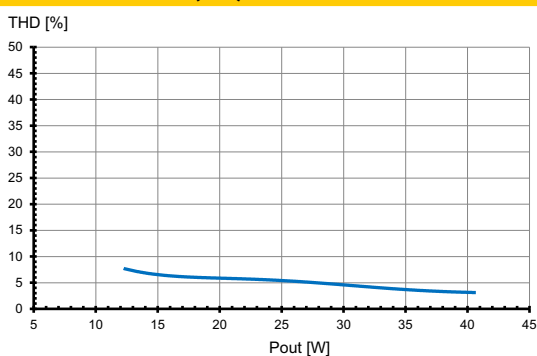
### Efficiency



### Power factor

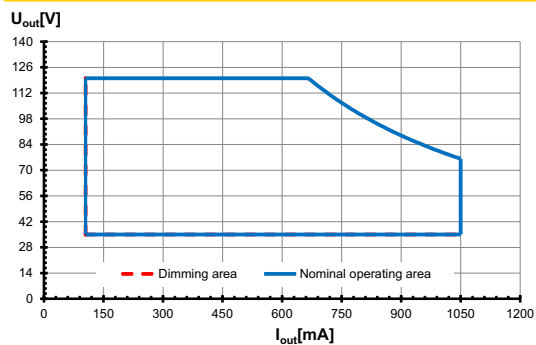


### Total harmonic factor (THD)

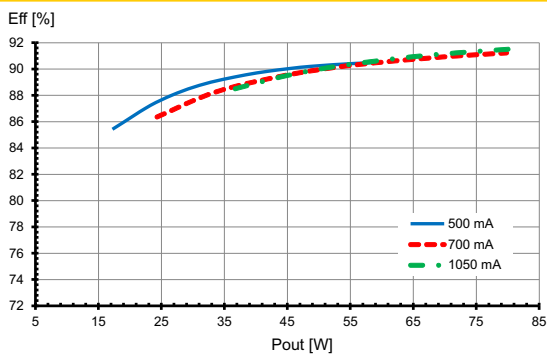


## Typ. performance graphs for 187465 / Type ECXd 1050.683

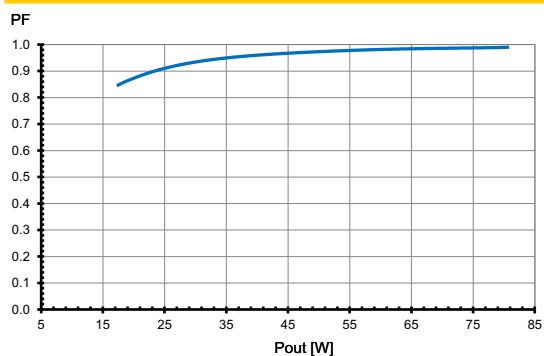
### Working area



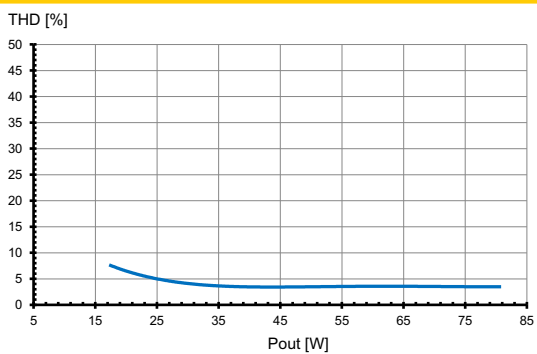
### Efficiency



### Power factor



### Total harmonic factor (THD)

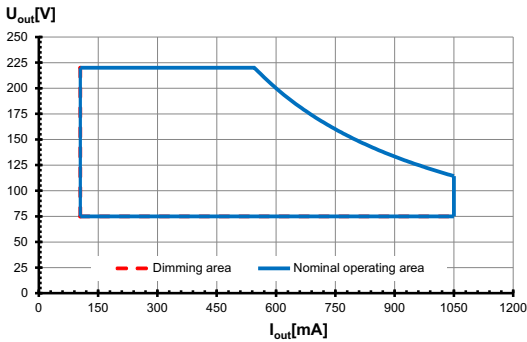


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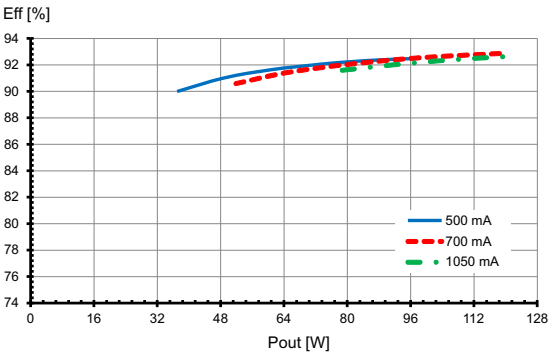
# LED Drivers – ComfortLine Prog S 1-10 V MidNight

Typ. performance graphs for 187466 / Type ECXd 1050.684

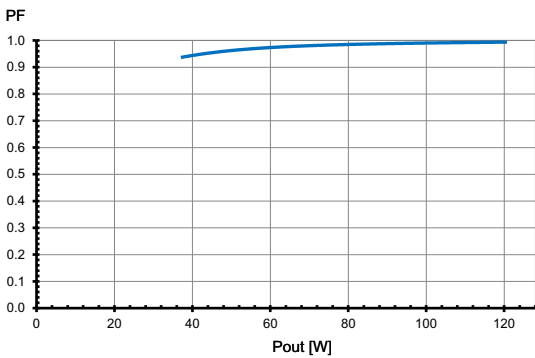
Working area



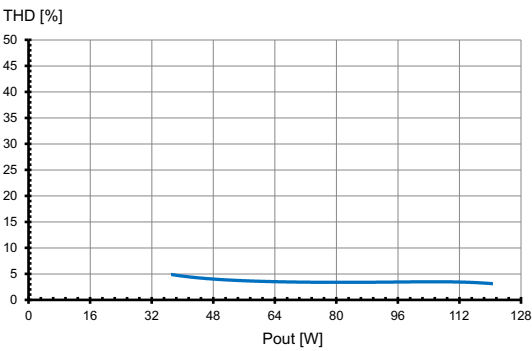
Efficiency



Power factor

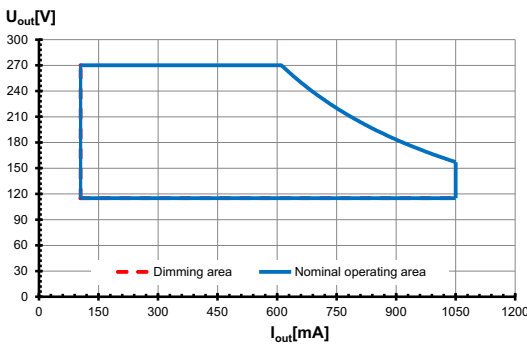


Total harmonic factor (THD)

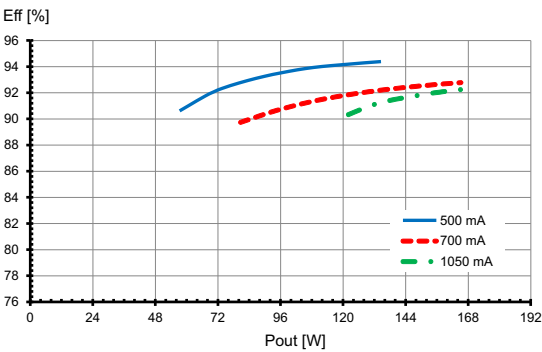


Typ. performance graphs for 187467 / Type ECXd 1050.685

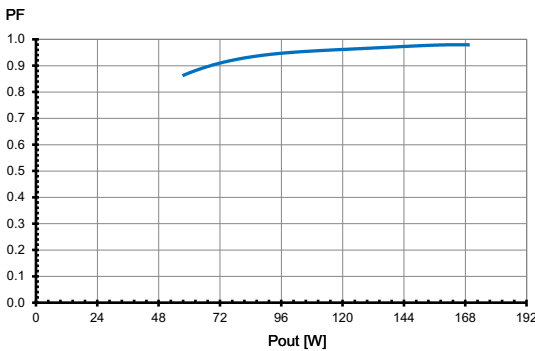
Working area



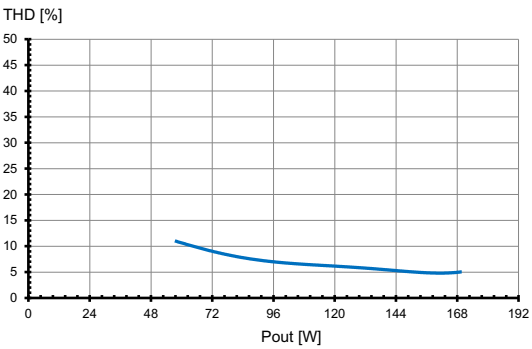
Efficiency



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 4 kV  
Surges between L/N–PE: up to 6 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:
- 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.

## System architecture

- You can program the VS ComfortLine Prog S 1–10 V MidNight drivers with the VS iProgrammer Street
- The LED driver is programmed via USB in a de-energised state
- The use of the USB 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 VS iProgrammer Street 2 software.



## Dimming

- Dimming: 1–10 V
- Dimming range: 10 to 100%

## 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.

## 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.

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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

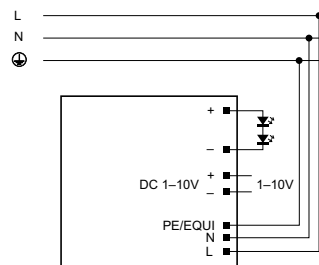
### Mechanical mounting

- 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: Push-in terminals for rigid or flexible conductors with a section of 0.5–2.5 mm<sup>2</sup> on input side and 0.2–1.5 mm<sup>2</sup> on output side; (dimming: 0.2–1.5 mm<sup>2</sup>).
- 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.
- Polarity: Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- Through-wiring: Is not allowed.
- Secondary load: The sum of forward voltages of LED loads has to be within the tolerances which are mentioned in the table "Electrical Characteristics" in this data sheet.

### Wiring diagram:



### Selection of automatic cut-outs for VS LED drivers

- Dimensioning automatic cut-outs  
High transient currents occur when an LED driver is switched on because the capacitors have to load. Ignition of LED modules occurs almost simultaneously. This also causes a simultaneous high demand for power. These high currents when the system is switched on put a strain on the automatic conductor cut-outs, which must be selected and dimensioned to suit.
- Release reaction  
The release reaction of the automatic conductor cut-outs comply with VDE 0641, part 11, for B, C characteristics. The values shown in the following tables are for guidance purposes only and are subject to system-dependent change.
- No. of LED drivers  
The maximum number of VS LED drivers applies to cases where the devices are switched on simultaneously. Specifications apply to single-pole fuses. The number of permissible drivers must be reduced by 20% for multi-pole fuses. The considered circuit impedance equals 400 mΩ (approx. 20 m [2.5 mm<sup>2</sup>] of conductor from the power supply to the distributor and a further 15 m to the luminaire).

Type	Ref. No.	Automatic cut-out type and possible no. of VS drivers pcs.		
<b>Automatic cut-out type B</b>		B 10 A	B 13 A	B 16 A
ECXd 1050.682	<b>187464</b>	6	8	9
ECXd 1050.683	<b>187465</b>	4	6	7
ECXd 1050.684	<b>187466</b>	4	5	7
ECXd 1050.685	<b>187467</b>	2	3	4
<b>Automatic cut-out type C</b>		C 10 A	C 13 A	C 16 A
ECXd 1050.682	<b>187464</b>	10	13	16
ECXd 1050.683	<b>187465</b>	8	10	12
ECXd 1050.684	<b>187466</b>	7	9	11
ECXd 1050.685	<b>187467</b>	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 ComfortLine Prog S 1-10 V MidNight 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](http://www.vossloh-schwabe.com).

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