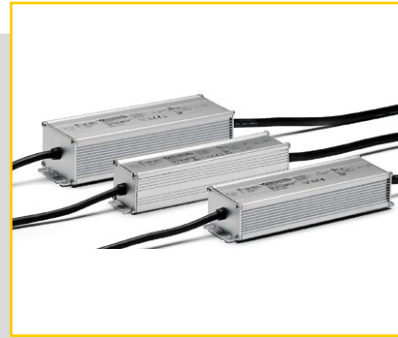


ROBUST LED DRIVERS



EasyLine – INDUSTRY

**186452, 186453, 186454, 186455, 186456, 186477,
186510, 186617**

Typical Applications

Built-in in compact luminaires for

- Industrial lighting



EasyLine – Industry

- **ENCAPSULATED CASING (IP67 OR IP65)**
- **VERY ROBUST CASING**
- **POWER FACTOR: > 0.90**
- **LONG SERVICE LIFETIME: UP TO 50,000 HRS.**
- **OPTIMUM PRICE PERFORMANCE RATIO**
- **PRODUCT GARANTUEE: 3 YEARS**

EasyLine LED Drivers

Product features

- Robust casing shape

Functions

- Moisture resistant with IP65/IP67 protection

Electrical features

- Mains voltage: 220–240 V ±10%
- Mains frequency: 50–60 Hz
- Pre-assembled connection leads:
 - primary: 3x2.08 mm², length: 320 mm
 - secondary: 2x2.08 mm², length: 320 mm
- Power factor at full load: > 0.95
- Secondary side switching of LED modules is not allowed.

Safety features

- Protection against transient main peaks up to 1.5 kV (between L and N) (186617: up to 4 kV between L and N)
- Electronic short-circuit protection
- Overload protection
- Protection against "no load" operation
- Degree of protection: IP67 (186617: IP65)
- Protection class I

Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
186452	12	45	660
186453	12	45	660
186454	12	45	714
186455	12	45	840
186456	12	45	840
186510	12	45	1050
186477	12	45	840
186617	12	45	840

Product guarantee

- 3 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.

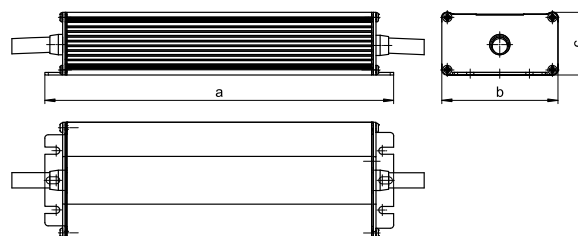


Dimensions

Ref. No.	Casing	Length [a] mm	Width [b] mm	Height [c] mm
186452	M56	185.5	49.4	40.6
186453	M56	185.5	49.4	40.6
186454	M58	205.6	49.4	40.6
186455	M58.1	206	68.6	37
186456	M58.1	206	68.6	37
186477	M58.1	206	68.6	37
186510	M65	216	68.6	46.3
186617	M58.1	206	68.6	37

Used standards

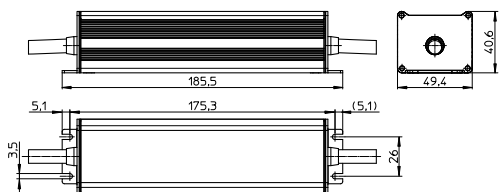
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 61000-3-2
- EN 62384
- EN 55015



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

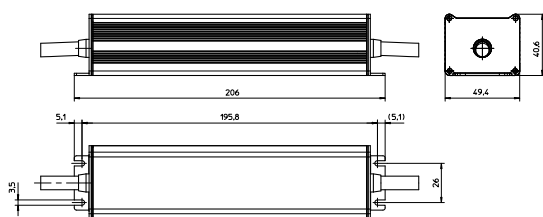
Product drawings and photos

M56



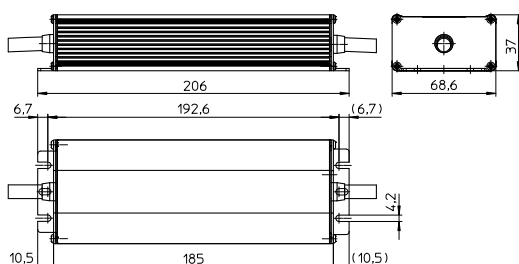
M56 – 186452, 186453

M58



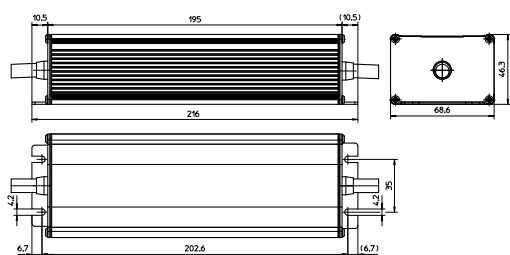
M58 – 186454

M58.1



M58.1 – 186455, 186456, 186477, 186617

M65



M65 – 186510

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 / 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 %
50	ECXe 700.156	186452	220–240	260–240	29.4 / 194	700	35–72	6	> 88	< 40
75	ECXe 1050.157	186453	220–240	380–350	36.7 / 213	1050	35–72	5	> 88	< 40
100	ECXe 1400.158	186454	220–240	520–470	50 / 105	1400	30–72	6	> 90	< 40
122	ECXe 1700.159	186455	220–240	640–580	108 / 78	1700	30–72	9	> 90	< 40
122	ECXe 1050.235	186617	220–240	630–570	45 / 280	1050	60–116	7	> 85	< 20
150	ECXe 2100.160	186456	220–240	790–720	52 / 470	2100	45–72	9	> 90	< 40
175	ECXe 2400.167	186510	220–240	920–820	93 / 203	2400	36–73	14	> 85	< 40
201	ECXe 2800.168	186477	220–240	1020–930	130 / 153	2800	45–72	9	> 85	< 40

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 max.	Degree of protection
	°C min.	°C max.	% min.	% max.	°C min.	°C max.	% min.	% max.		
186452	-30	60	5	60	-40	+85	5	95	75	IP67
186453	-30	60	5	60	-40	+85	5	95	80	IP67
186454	-30	50	5	60	-40	+85	5	95	80	IP67
186455	-30	50	5	60	-40	+85	5	95	75	IP67
186617	-40	50	5	60	-40	+85	5	95	75	IP65
186456	-30	50	5	60	-40	+85	5	95	75	IP67
186510	-30	50	5	60	-40	+85	5	95	80	IP67
186477	-30	50	5	60	-40	+85	5	95	80	IP67

Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No.		Ref. No.	
	75 °C	65 °C	80 °C	70 °C
all	186452, 186455, 186456, 186617	186453, 186454, 186510, 186477		
hrs.	30,000	50,000	30,000	50,000

Product labels

PRI
UN = 220...240V~
In = 260...240 mA
fn = 50...60 Hz
I > 0,95
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 700.156
Ref.No. 186452
Made in China

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

SEC
700mA
U = 35...72 V
Uout < 85 V
Pmax = 50,4 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 380...350 mA
fn = 50...60 Hz
I > 0,95
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 1050.157
Ref.No. 186453
Made in China

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

SEC
1050mA
U = 35...72 V
Uout < 85 V
Pmax = 75,6 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 520...470 mA
fn = 50...60 Hz
I > 0,90
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 1400.158
Ref.No. 186454
Made in China

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

SEC
1400mA
U = 30...72 V
Uout < 85 V
Pmax = 100,8 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 640...590 mA
fn = 50...60 Hz
I > 0,90
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 1700.159
Ref.No. 186455
Made in China

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

SEC
1700mA
U = 30...72 V
Uout < 95 V
Pmax = 122,4 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 790...720 mA
fn = 50...60 Hz
I > 0,95
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 2100.160
Ref.No. 186456
Made in China

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

SEC
2100mA
U = 45...72 V
Uout < 85 V
Pmax = 150 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 1020...930 mA
fn = 50/60 Hz
I > 0,95
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 2800.168
Ref.No. 186477
Made in China

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

SEC
2800 mA
U = 45...72 V
Uout < 120 V
Pmax = 201,6 W
SELV
IP 67
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 900...820 mA
fn = 50/60 Hz
I > 0,95
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 2400.167
Ref.No. 186510
Made in China

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

SEC
2400 mA
U = 36...73 V
Uout < 120 V
Pmax = 175,2 W
IP 67
SELV
SEC + = White
SEC - = Black

PRI
UN = 220...240V~
In = 630...570 mA
fn = 50/60 Hz
I > 0,98
Gr/Yel
L = Brown
N = Blue

VSLIGHTING SOLUTIONS
Electronic Converter for LED
Type ECXe 1050.235
Ref.No. 186617
Made in China

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

SEC
1050 mA
U = 60...116 V
Uout < 120 V
Pmax = 121,8 W
IP 65
SELV
SEC + = White
SEC - = Black

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

Safety functions

- Transient mains peaks protection:
Values are in compliance with EN 61547
(interference immunity).
Surges between L/N: up to 1.5 kV
(186617: up to 4 kV between L/N)
- 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 (< 60 V DC).
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.

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

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

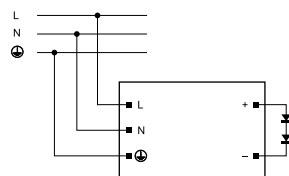
Mechanical mounting

- Mounting position: Built-in: Any position inside a luminaire is allowed
Independent application: Drivers with pre-assembled connection leads are allowed to use for independent applications.
- Mounting location: LED drivers are designed for integration into luminaires or comparable devices. Independent LED drivers do not need to be integrated into a casing.
Installation in outdoor luminaires: degree of protection for LED drivers IP67 (186617: IP65).
- Degree of protection: IP67 (186617: IP65)
- 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 leads: Pre-assembled, primary: 3x2.08 mm², length: 320 mm, secondary: 2x2.08 mm², length: 320 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. secondary side lead length: 0.8 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 is within the tolerances which are mentioned in the Electrical Characteristics on the data sheet.
- Parallel wiring: Parallel connection of LED loads is not allowed.
- 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 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 10 A	B 13 A	B 16 A	C 10 A	C 13 A	C 16 A
ECXe 700.156	186452	10	13	17	17	23	28
ECXe 1050.157	186453	10	13	16	17	22	27
ECXe 1400.158	186454	17	22	27	17	22	27
ECXe 1700.159	186455	10	13	16	14	18	22
ECXe 2100.160	186456	3	4	5	5	6	8
ECXe 2400.167	186510	4	5	7	7	9	11
ECXe 2800.168	186477	4	5	7	7	9	11
ECXe 1050.235	186617	5	7	8	9	12	14

- 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-6K (Ref. No.: 149820) or ESB-16HS (Ref. No.: 149821) inrush current limiters.

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