CC ComfortLine Prog S-1-10 V 100 V IP

COMFORTLINE PROG S-1–10 V 100 V IP

187082, 187083, 187084, 187085, 187086, 187087

Typical Applications

Built-in in compact luminaires

- Street lighting
- Industrial lighting

1–10 V

ComfortLine Prog S-1–10 V 100 V IP

- **DEGREE OF PROTECTION: IP67**
- **SELECTABLE OUTPUT CURRENT VIA OFFLINE PROGRAMMING**
- **DIMMABLE: 1–10 V**
- **MIDNIGHT FUNCTION**
- **VERY LOW RIPPLE CURRENT: < 5%**
- **SURGE PROTECTION: UP TO 10 KV**
- **PREASSEMBLED CONNECTION LEADS**
- **LONG SERVICE LIFE: UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**

MidNight™ Multi-Step Dimming

5 YEARS GUARANTEE

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ComfortLine Prog S 100 V 1–10 V IP

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: 100–277 V ±10%
- Mains frequency: 50/60 Hz
- Pre-assembled connection leads:
  primary: 3x1 mm² (AWG17), length: 300 mm
  secondary: 2x1 mm² (AWG17),
  1–10 V and programming: 2x0.35 mm² (AWG22), length: 300 mm
- Power factor at full load: > 0.97
- Open circuit voltage ($U_{max.}$) / Max. working voltage (U_{OUT}):

Ref. No.	$U_{max.}$ (V)	U_{OUT} (V)
187082	108	–
187083	–	150
187084	–	214
187085	–	285
187086	–	343
187087	–	457

- Secondary side switching of LED modules is not allowed.

Safety features
- Protection against transient main peaks up to 5 kV (between L and N) and up to 10 kV (between L/N and PE)
- Electronic short-circuit protection
- Overload protection
- Overtemperature protection
- Protection against "no load" operation
- Degree of protection: IP67
- Protection class I
- SELV (only for 187082)

Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
187082	10	49	550
187083	10	49	700
187084	10	49	800
187085	10	42	950
187086	10	42	1150
187087	8	42	1550

IP67 · SELV (187082) · 187082 · 187083, 187084, 187085, 187086, 187087 · 110 (187084, 187087) · OVERLOAD PROTECTION · MidNight Multi-Step Dimming · 0% NO LOAD OPERATION · CLO · 50 000 hours Min. Service Lifetime · Guarantee 5 years

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

Dimensions

Ref. No.	Casing	Length mm	Width mm	Height mm
187082	M87.1	128.6	68	37
187083	M88.1	153.6	68	37
187084	M89.1	173.6	68	37
187085	M90.1	193.6	68	39
187086	M91.1	208.6	68	39
187087	M92.1	231	98	42

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
1–10 V

Current adjustment
offline

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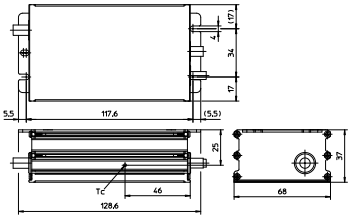
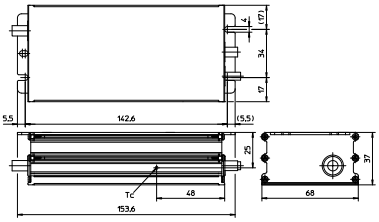
Product drawings and photos

M87.1



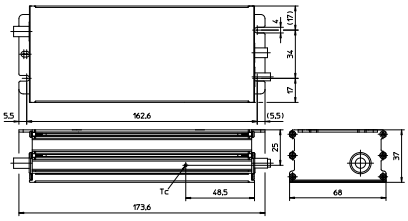

M87.1 – 187082

M88.1




M88.1 – 187083

M89.1




M89.1 – 187084

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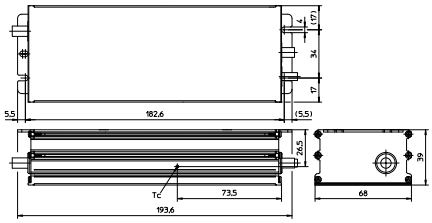


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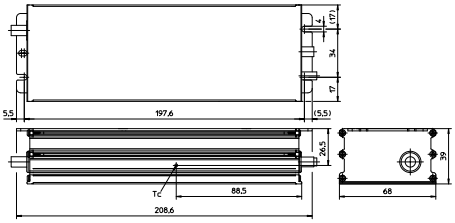
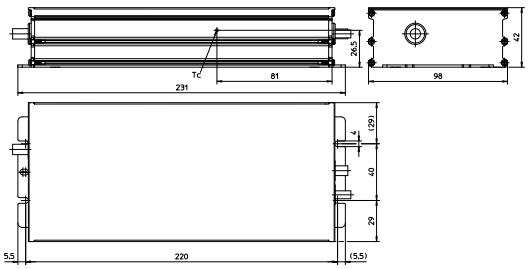
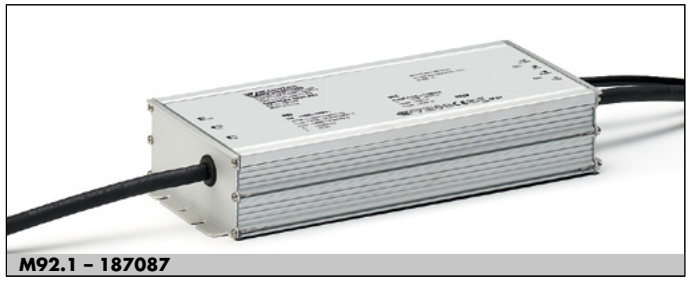
M91.1




M91.1 – 187086

M92.1




M92.1 – 187087

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Electrical characteristics

Max. output W	Type	**Ref. No.**	Voltage 50–60 Hz V ±10%	Mains current mA	Inrush current A / µs	Current output DC mA (± 5%)	Factory settings mA	Voltage output DC (V)	THD at full load % (230 V)	Efficiency at full load % (230 V)	Ripple 100 Hz %
75	ECXd 1050.446	**187082**	100–277	870–310	63 / 200	100–1050	700	40–108	7	90	< 10
105	ECXd 1050.447	**187083**	100–277	1220–430	52 / 276	100–1050	700	65–157	3	93.5	< 10
150	ECXd 1050.448	**187084**	100–277	1700–600	68 / 308	100–1050	700	100–214	3	94.5	< 10
200	ECXd 1050.449	**187085**	100–277	2300–820	86 / 336	100–1050	700	130–286	4	93.5	< 5
240	ECXd 1050.450	**187086**	100–277	2700–970	59 / 500	100–1050	700	115–349	4	94.5	< 5
320	ECXd 1100.451	**187087**	100–277	3650–1300	76 / 600	110–1100	700	220–457	7	93.5	< 10

Maximum ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the drivers.

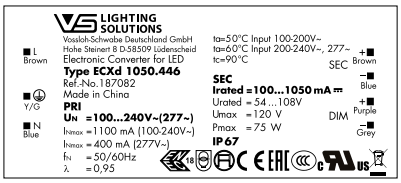
Ref. No.	Ambient temperature range		Operation humidity range		Storage temperature range		Storage humidity range		Max. operation temperature at t_c point	Degree of protection
	°C min.	°C max.	% min.	% max.	°C min.	°C max.	% min.	% max.	°C	
All types	–40	+60	5	60	–40	+85	5	95	+75	IP67

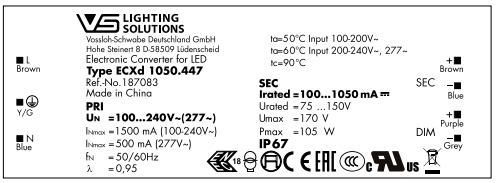
Expected service life time

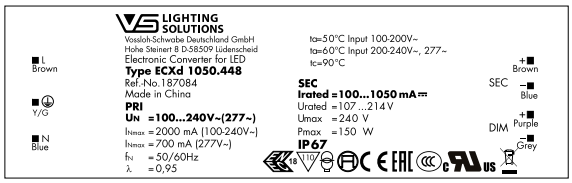
at operation temperatures at t_c point

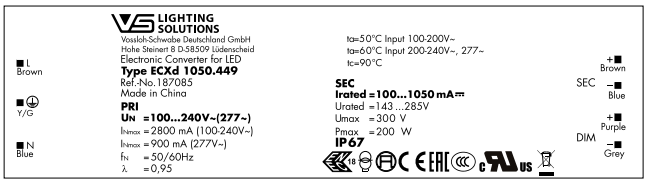
Operation current	Ref. No. All types	
All	65 °C	75 °C
hrs.	100,000	50,000

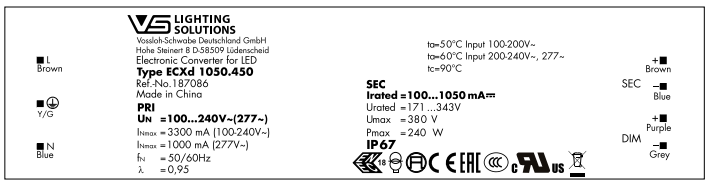
Product labels

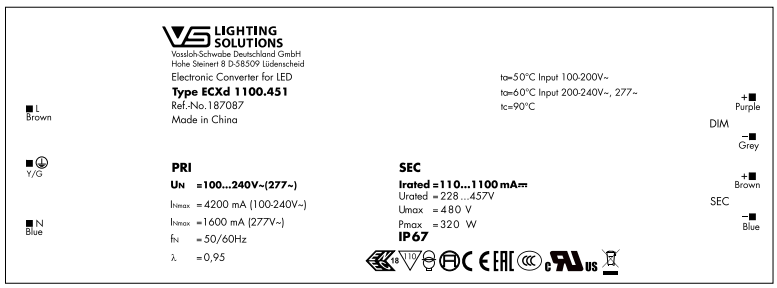












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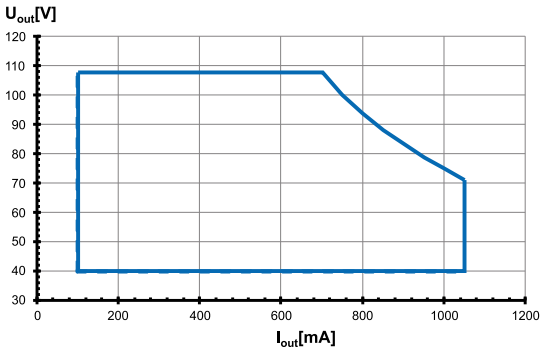
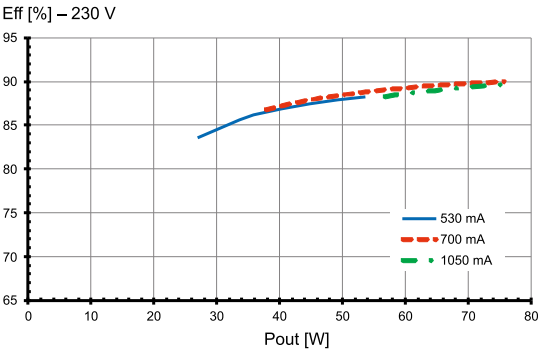
Typ. performance graphs for 187082 / Type ECXd 1050.446

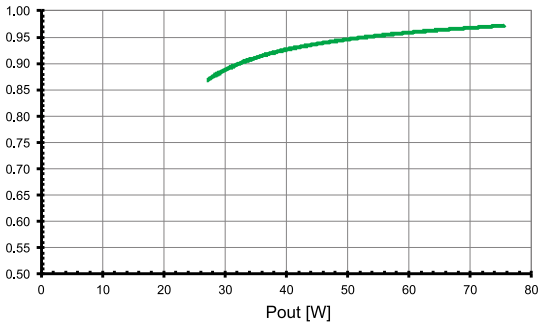
Working area



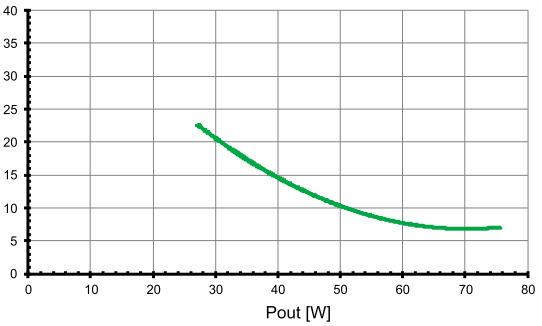
Efficiency at 230 V



Power factor at 230 V

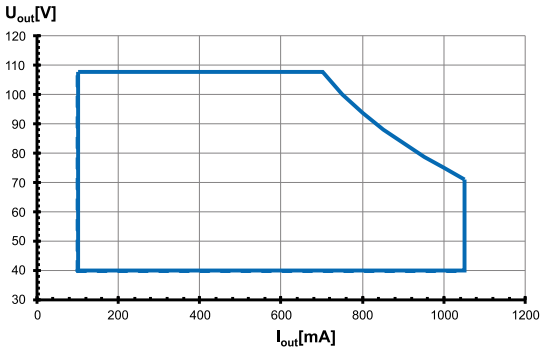


Total harmonic factor (THD) at 230 V

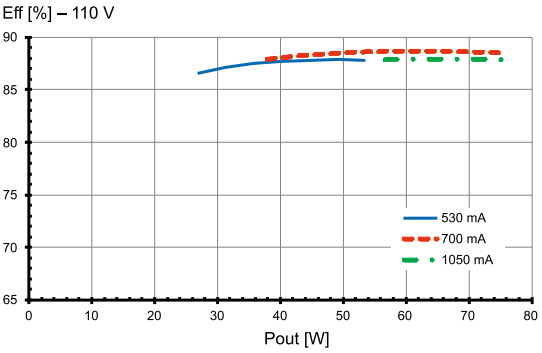


Typ. performance graphs for 187082 / Type ECXd 1050.446

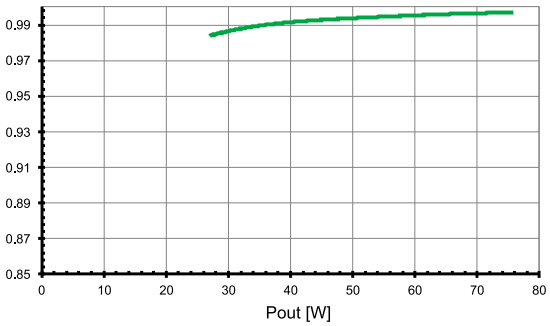
Working area



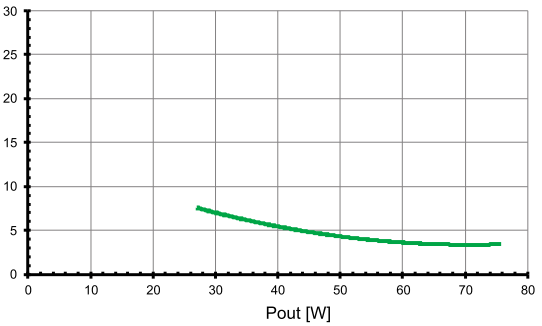
Efficiency at 110 V



Power factor at 110 V



Total harmonic factor (THD) at 110 V



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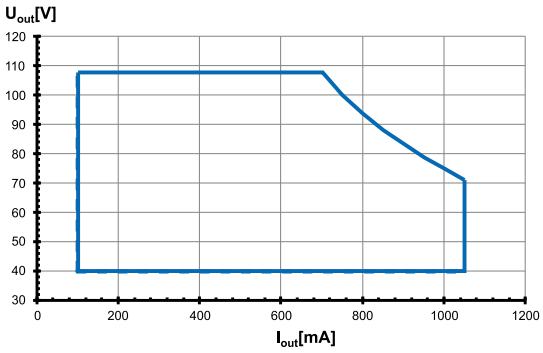
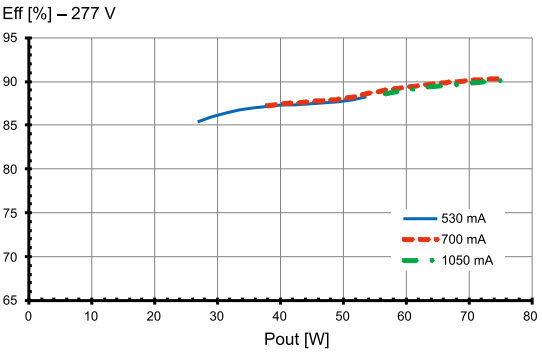
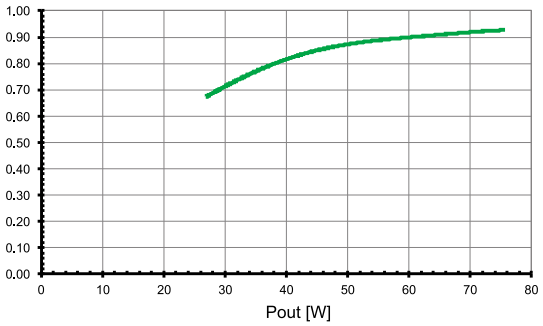
Working area



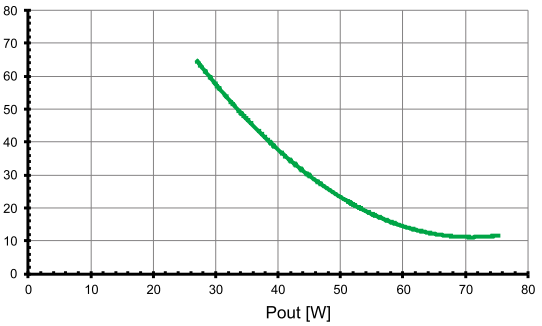
Efficiency at 277 V



Power factor at 277 V

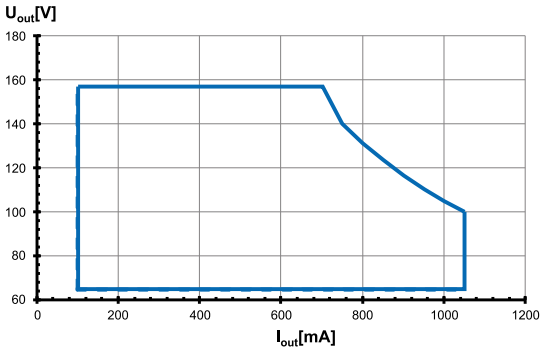


Total harmonic factor (THD) at 277 V

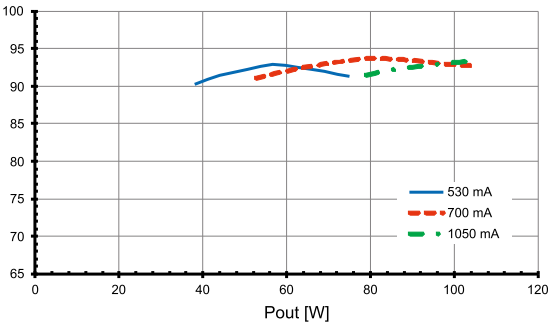


Typ. performance graphs for 187083 / Type ECXd 1050.447

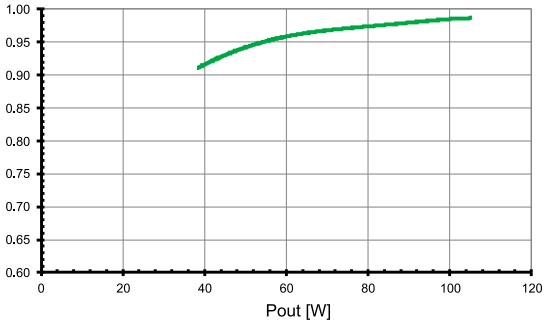
Working area



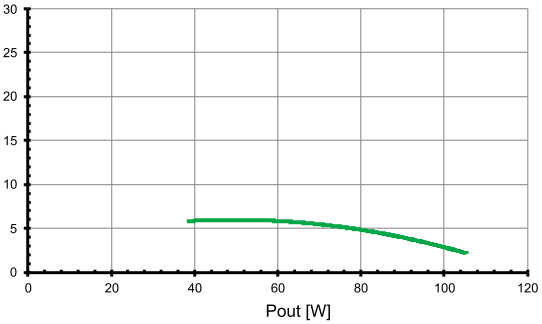
Efficiency at 230 V



Power factor at 230 V



Total harmonic factor (THD) at 230 V



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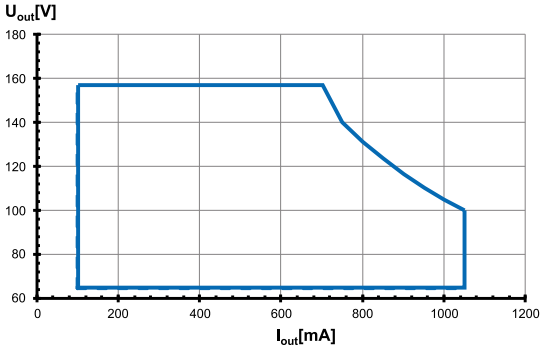
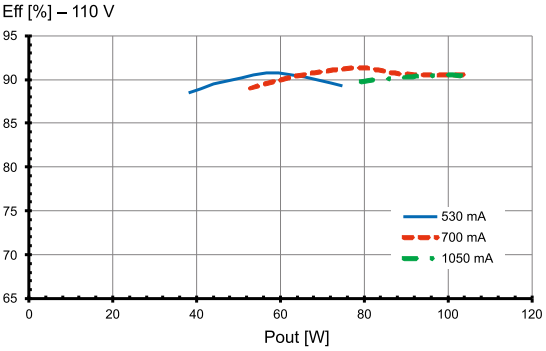
Typ. performance graphs for 187083 / Type ECXd 1050.447

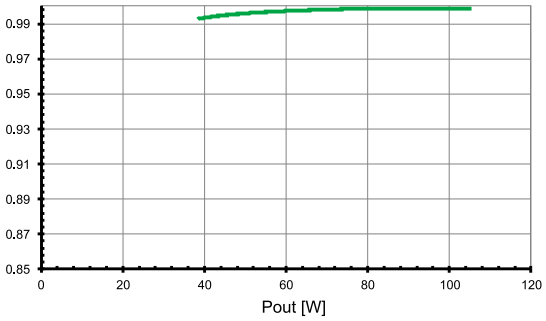
Working area



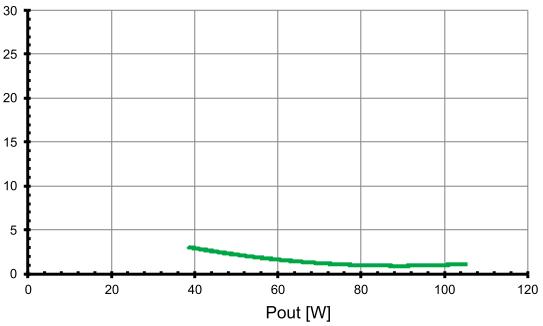
Efficiency at 110 V



Power factor at 110 V

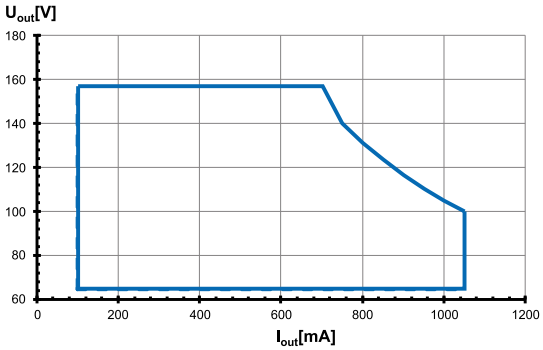


Total harmonic factor (THD) at 110 V

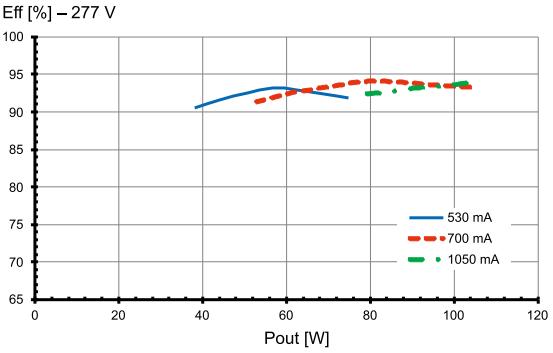


Typ. performance graphs for 187083 / Type ECXd 1050.447

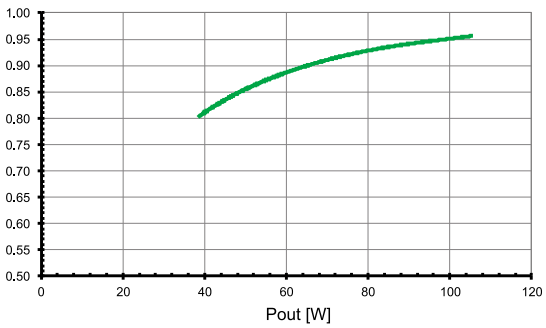
Working area



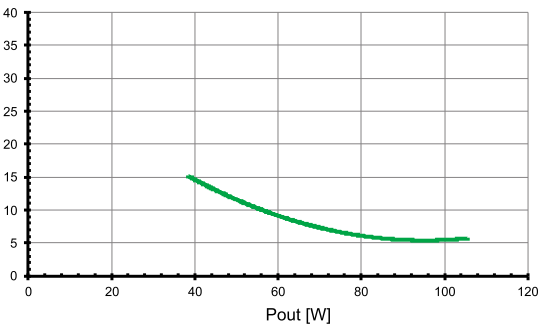
Efficiency at 277 V



Power factor at 277 V



Total harmonic factor (THD) at 277 V



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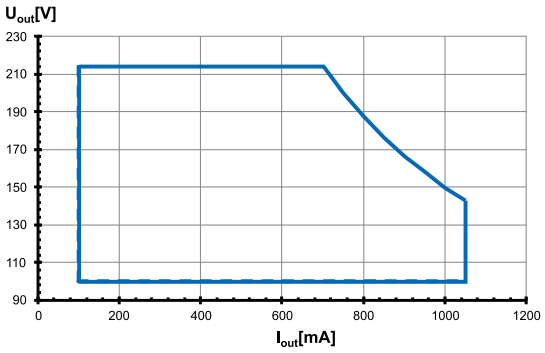
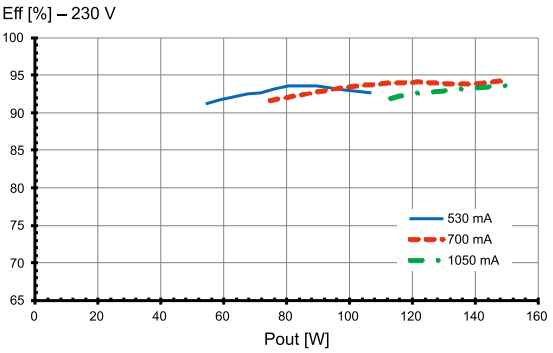
Typ. performance graphs for 187084 / Type ECXd 1050.448

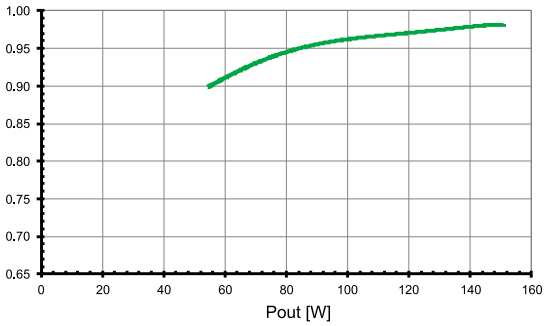
Working area



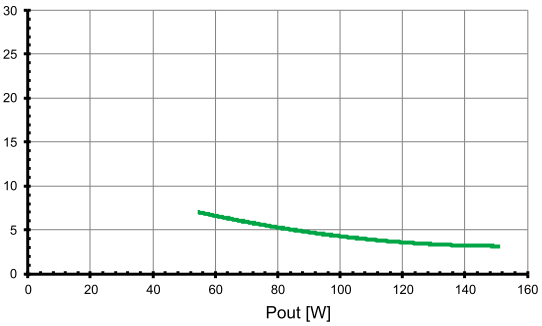
Efficiency at 230 V



Power factor at 230 V

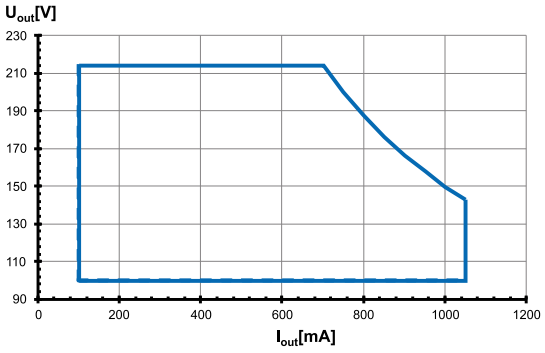


Total harmonic factor (THD) at 230 V

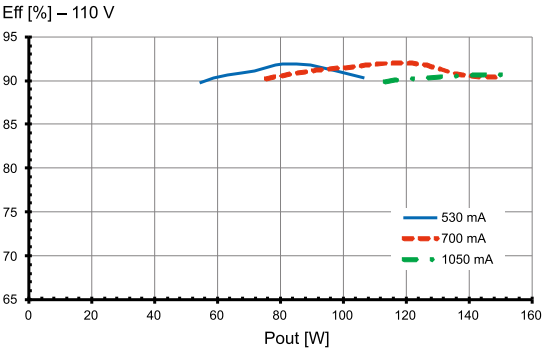


Typ. performance graphs for 187084 / Type ECXd 1050.448

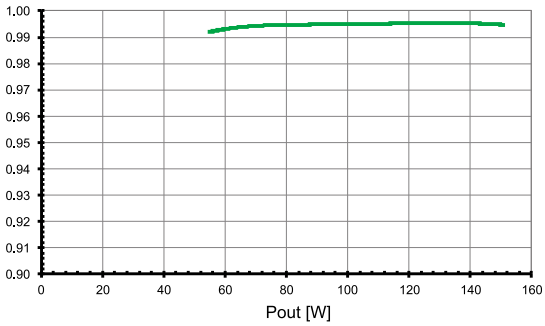
Working area



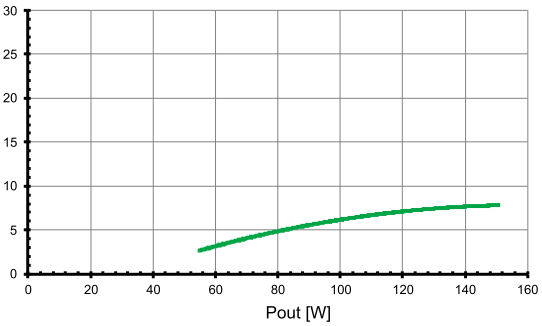
Efficiency at 110 V



Power factor at 110 V



Total harmonic factor (THD) at 110 V



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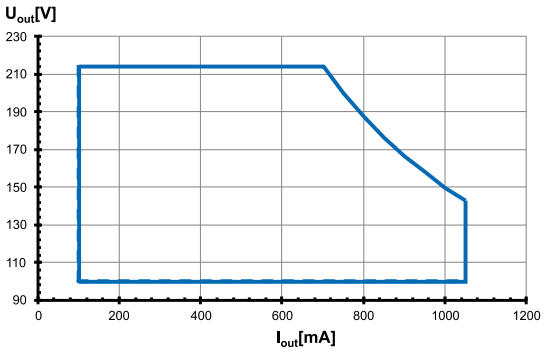
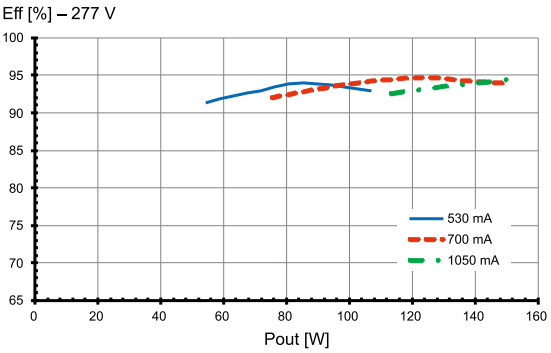
Typ. performance graphs for 187084 / Type ECXd 1050.448

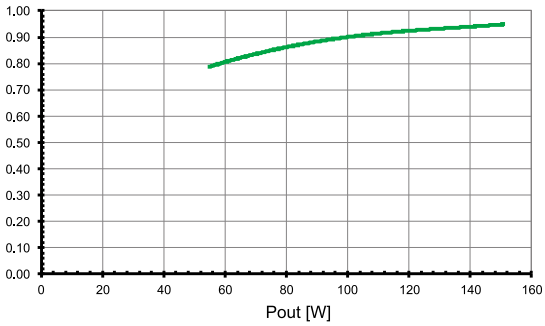
Working area



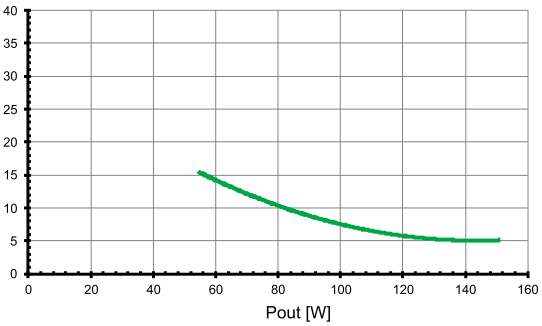
Efficiency at 277 V



Power factor at 277 V

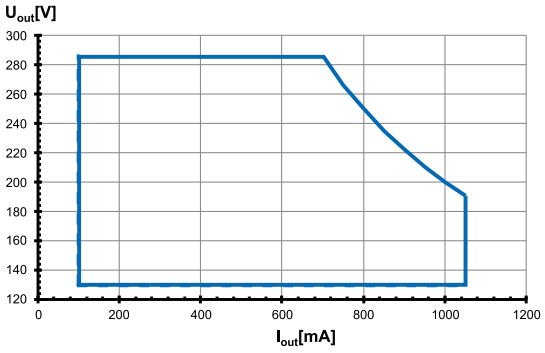


Total harmonic factor (THD) at 277 V

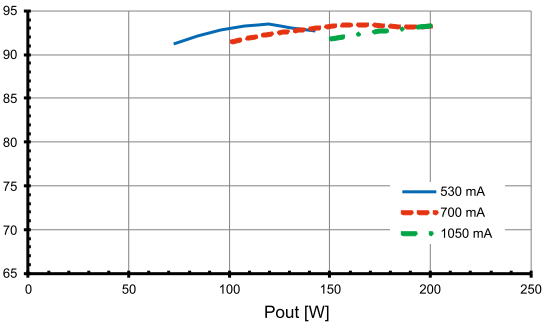


Typ. performance graphs for 187085 / Type ECXd 1050.449

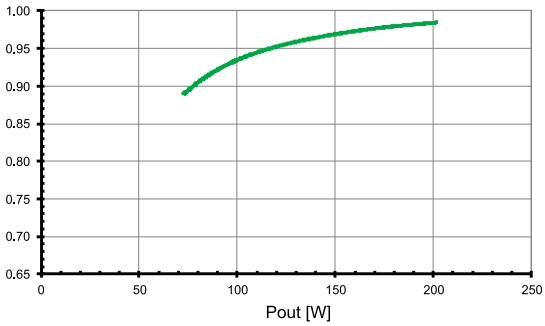
Working area



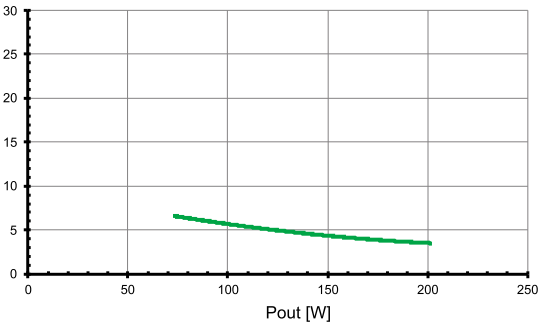
Efficiency at 230 V



Power factor at 230 V



Total harmonic factor (THD) at 230 V



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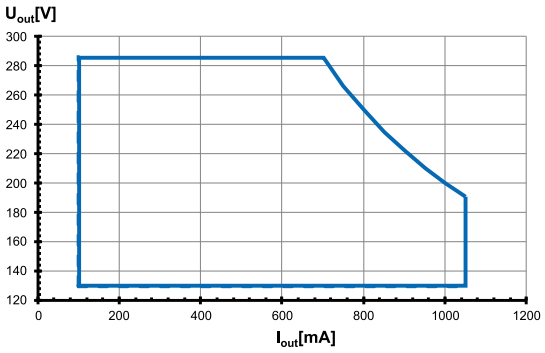
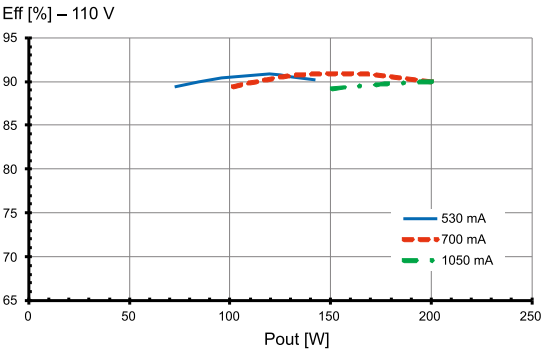
Typ. performance graphs for 187085 / Type ECXd 1050.449

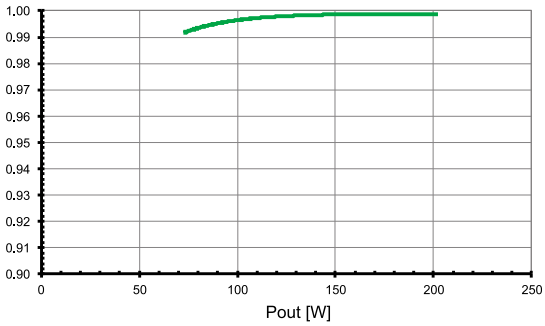
Working area



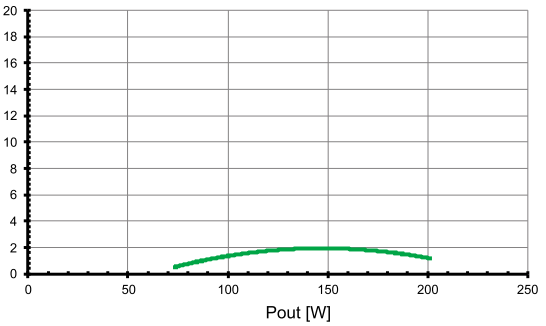
Efficiency at 110 V



Power factor at 110 V

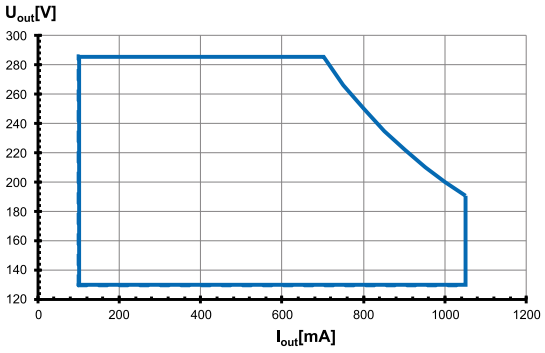


Total harmonic factor (THD) at 110 V

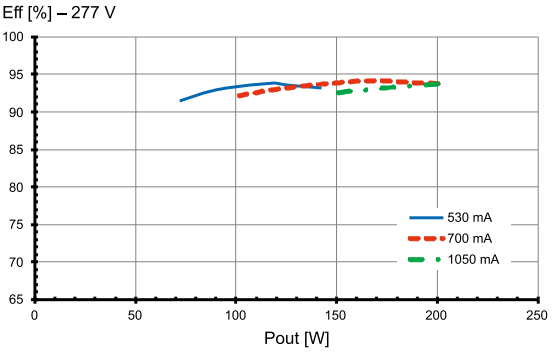


Typ. performance graphs for 187085 / Type ECXd 1050.449

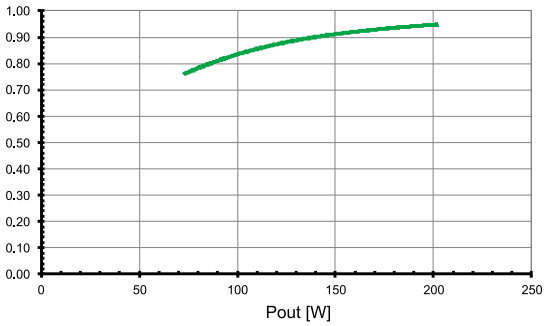
Working area



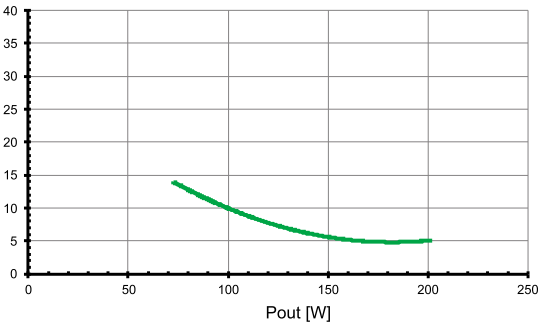
Efficiency at 277 V



Power factor at 277 V



Total harmonic factor (THD) at 277 V



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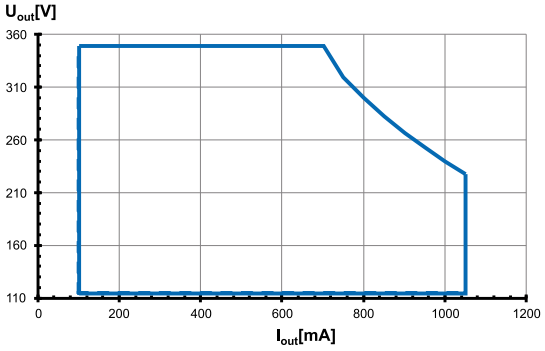
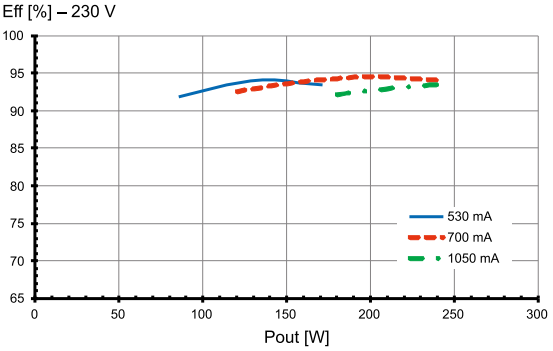
Typ. performance graphs for 187086 / Type ECXd 1050.450

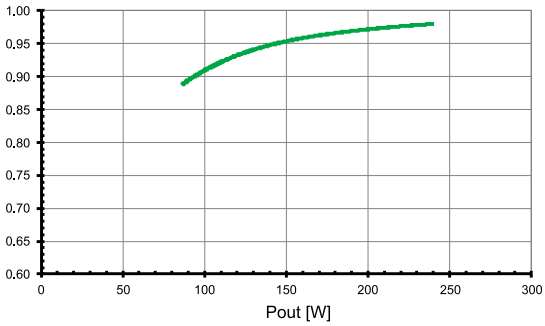
Working area



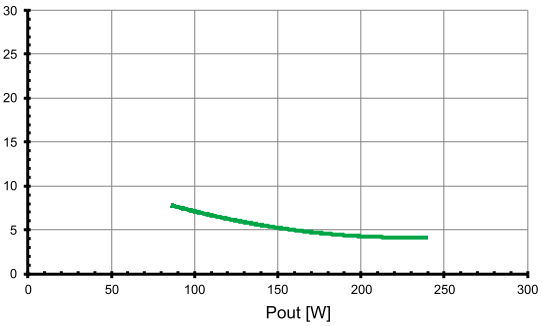
Efficiency at 230 V



Power factor at 230 V

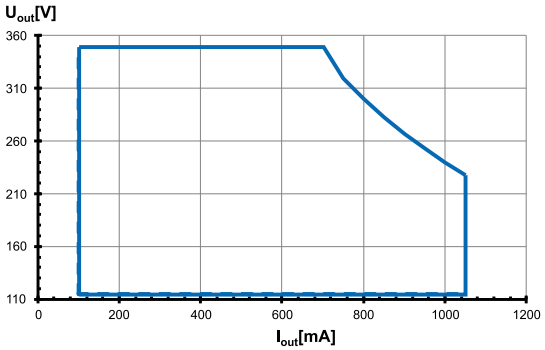


Total harmonic factor (THD) at 230 V

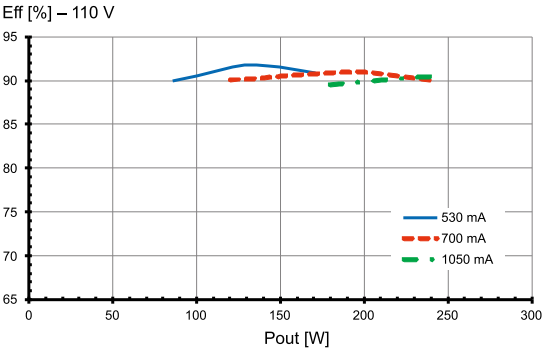


Typ. performance graphs for 187086 / Type ECXd 1050.450

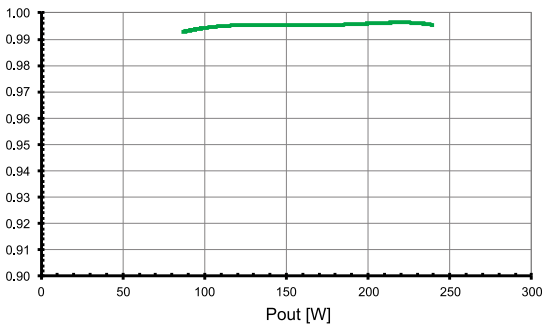
Working area



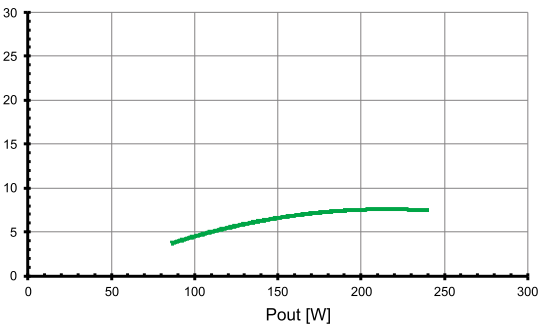
Efficiency at 110 V



Power factor at 110 V



Total harmonic factor (THD) at 110 V



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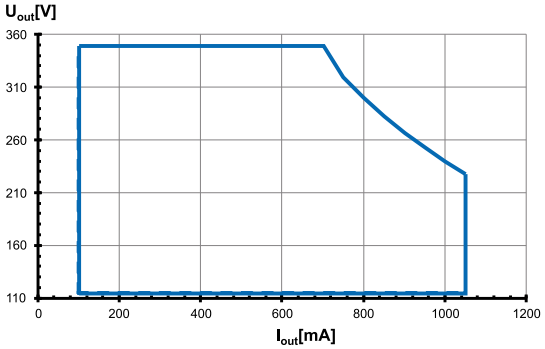
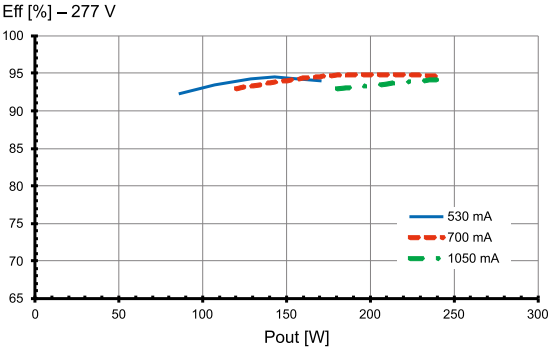
Typ. performance graphs for 187086 / Type ECXd 1050.450

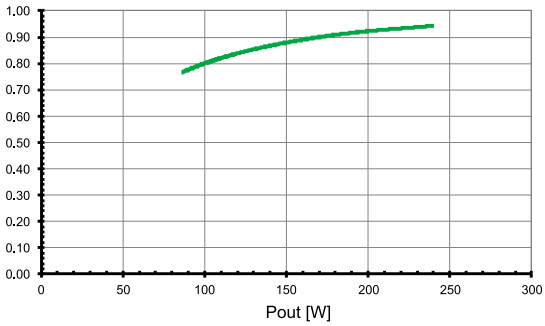
Working area



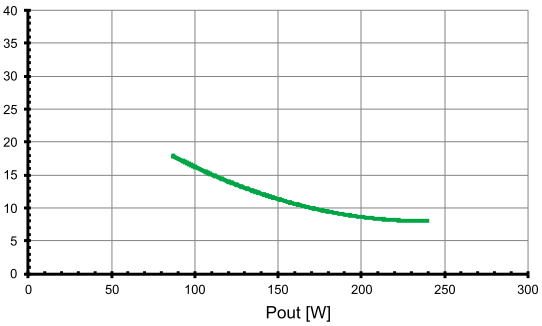
Efficiency at 277 V



Power factor at 277 V

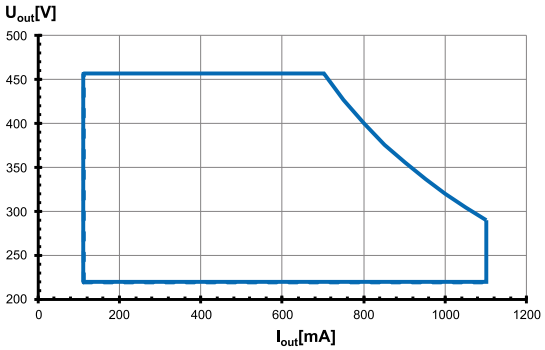


Total harmonic factor (THD) at 277 V

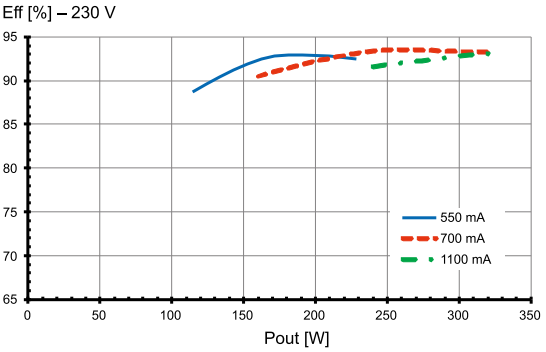


Typ. performance graphs for 187087 / Type ECXd 1100.451

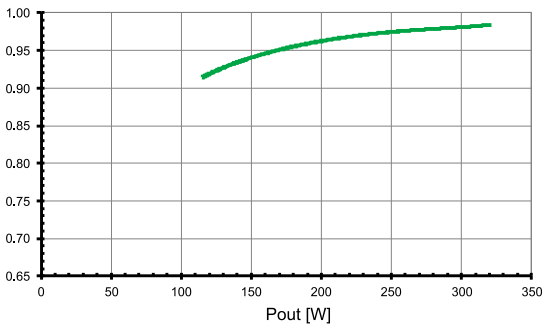
Working area



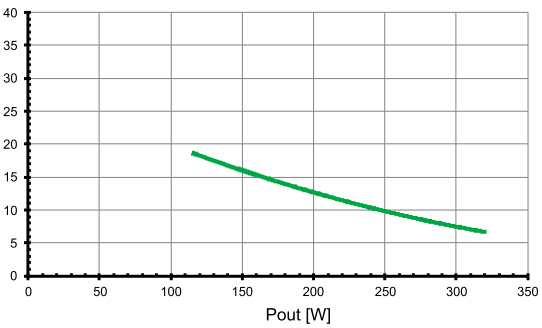
Efficiency at 230 V



Power factor at 230 V



Total harmonic factor (THD) at 230 V



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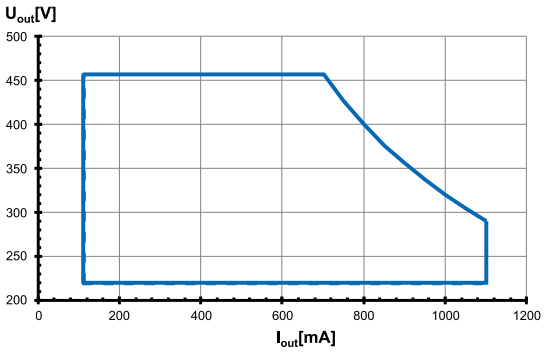
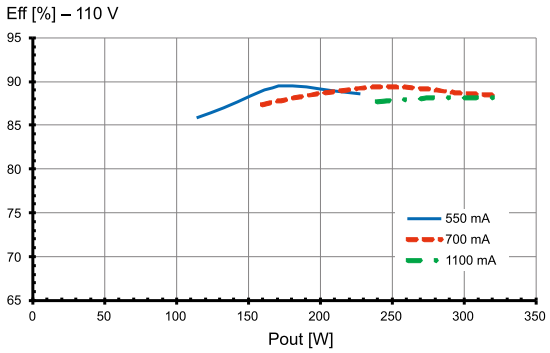
Typ. performance graphs for 187087 / Type ECXd 1100.451

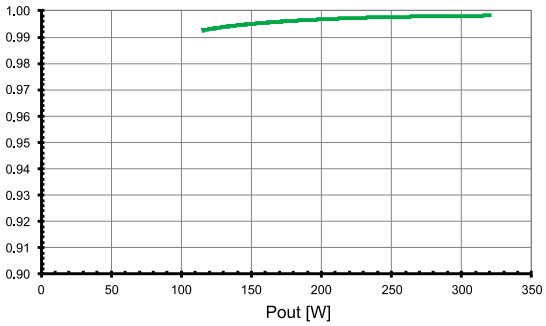
Working area



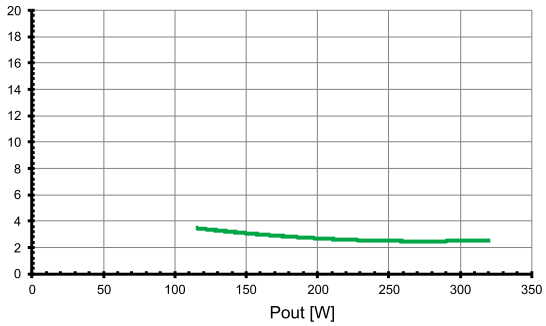
Efficiency at 110 V



Power factor at 110 V

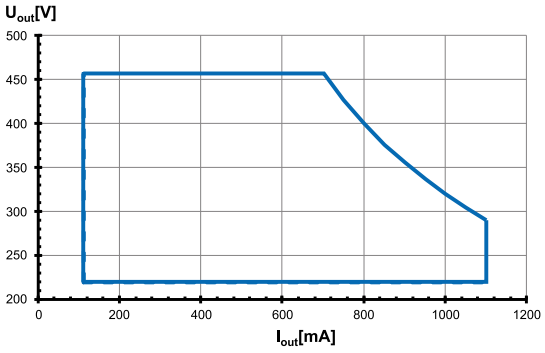


Total harmonic factor (THD) at 110 V

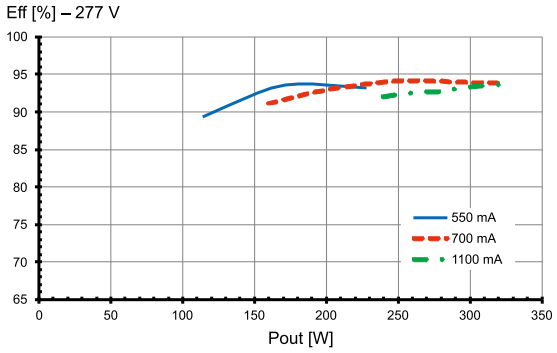


Typ. performance graphs for 187087 / Type ECXd 1100.451

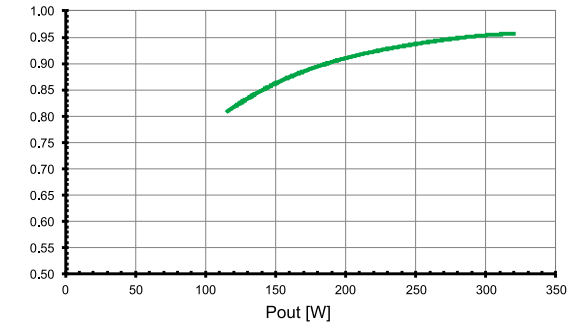
Working area



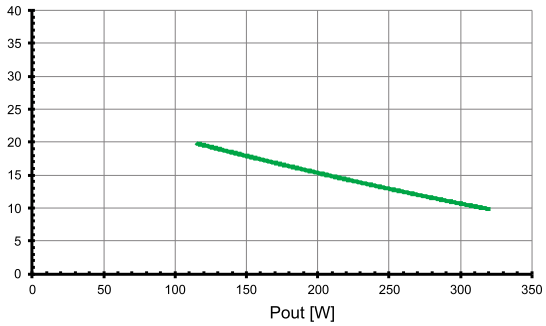
Efficiency at 277 V



Power factor at 277 V



Total harmonic factor (THD) at 277 V



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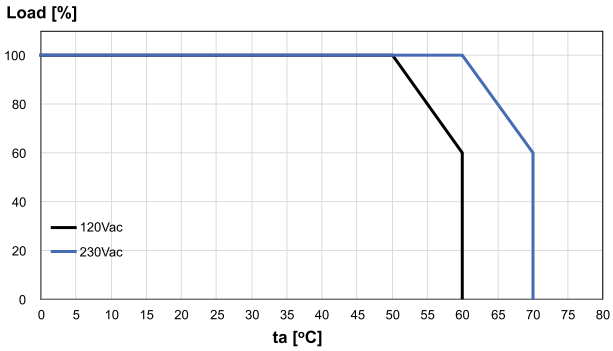
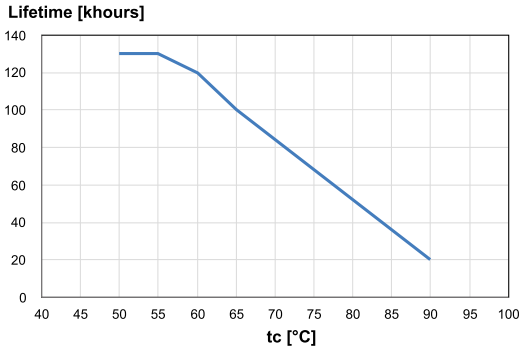
Load derating

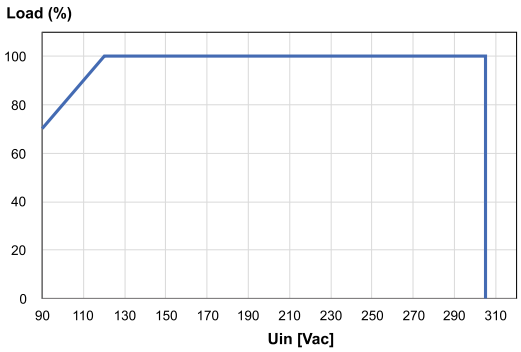
Load (%) vs. Ambient temperature t_a (°C)



Lifetime (khours) vs. Casing temperature t_c (°C)



Load (%) vs. Input voltage U_{in} (V AC)



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Safety functions

- Transient mains peaks protection: Values are in compliance with EN 61547 (interference immunity). Surges between L–N: upt to 5 kV and 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.
- 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.

System architecture

- You can program the VS ComfortLine Prog S-1–10 V 100 V IP 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.

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.

MidNight function

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

Dimming

- Minimum dimming level: 10% of selected operating current
- 1–10 V source current:

Ref. No.	Source current (µA)	Tolerance (µA)
187082	200	+100
187083	200	+100
187084	200	+100
187085	200	+100
187086	100	+200
187087	200	+200

VS iProgrammer Streetlight 2
Ref. No.: 187125

VS ComfortLine Prog S-100 V 1–10 V IP

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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

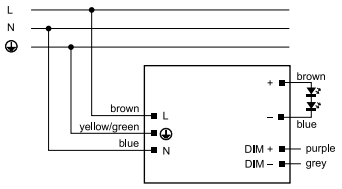
- DIN VDE 0100
- EN 60598-1

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.
- Degree of protection: IP67
  The driver operate normal under temporary immersion between 0,15 m and 1 m with the condition of the duration time is less than 30 min. and the water temperature does not differ from that of the driver by more than 5 K.
- 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

- The wire connection should be installed by professional person, reinforced insulation between L/N terminal block and accessible part should be fulfilled.
- The external flexible cable or cord of the LED driver cannot be replaced; if the cord is damaged, the LED driver shall be destroyed.
- During and after installation the connection of input terminal and output terminal should be enclosed to far away from water source.
- Output connection shall be installed by professional person, at least basic insulation corresponding to its max. output voltage should be maintained between current-carrying part of LED modules output and accessible surface or mounting surface after installation.
  187082: At least one pole of the conductive parts in the SELV circuit shall be insulated by insulation capable of withstanding a test voltage of 500 V r.m.s. for 1 min.
- Stripped length: 10 mm
- Terminal block not included. Installation must be performed by a qualified person.
- 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 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
ECXd 1050.446	**187082**	7	9	11	12	15	19
ECXd 1050.447	**187083**	4	5	6	6	8	10
ECXd 1050.448	**187084**	3	4	6	5	6	8
ECXd 1050.449	**187085**	3	4	4	4	5	7
ECXd 1050.450	**187086**	2	3	4	3	3	5
ECXd 1100.451	**187087**	1	1	2	2	3	3

LIGHTING SOLUTIONS
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