

CC STREET & INDUSTRY PROG DIMMABLE



COMFORTLINE PROG S-HSP 110 V 1-10 V IP

186774, 186775, 186776, 186777, 186778, 186779

Typical Applications

Built-in in compact luminaires

- Street lighting
- Industry lighting

1-10V

ComfortLine Prog S-HSP 110 V 1-10 V IP

- **DEGREE OF PROTECTION: IP67/IP66**
- **PROGRAMMABLE OUTPUT CURRENT**
- **DIMMABLE: 1-10 V**
- **DIMMING METHOD: ANALOGUE**
- **VERY LOW RIPPLE CURRENT: < 5%**
- **WIDE INPUT VOLTAGE RANGE: 110-277 V**
- **SURGE PROTECTION: UP TO 6 KV**
- **PREASSEMBLED CONNECTION LEADS**
- **LONG SERVICE LIFE:
UP TO 100,000 HRS.**
- **PRODUCT GUARANTEE: 5 YEARS**



ComfortLine Prog S-HSP 110 V 1–10 V IP

Product features

- For independent operation with integrated cord grip
- Active power factor correction
- Programmable via iProgrammer Streetlight
- Constant lumen output

Electrical features

- Mains voltage: 110–277 V $\pm 10\%$
- Mains frequency: 50–60 Hz
- Pre-assembled connection leads: primary and secondary and NTC/iProgrammer: 3x1 mm² (17 AWG), length: 300 mm
Signal (DIM/12 V Aux): 3x0.824 mm² (18 AWG) for 186774, 186775: 3x0.326 mm² (22 AWG), length: 300 mm
- Power factor at full load: 0.95
- Open circuit voltage (U_{max.}) / max. working voltage (U_{OUT}):

Ref. No.	U _{max.} (V)	U _{OUT} (V)
186774	120	—
186775	—	150
186776	—	250
186777	—	230
186778	—	250
186779	—	250

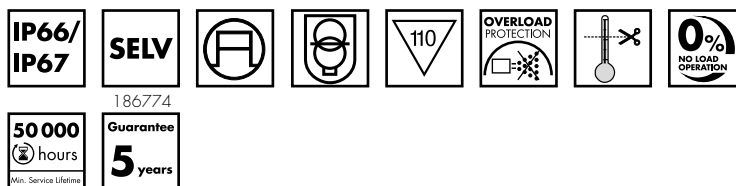
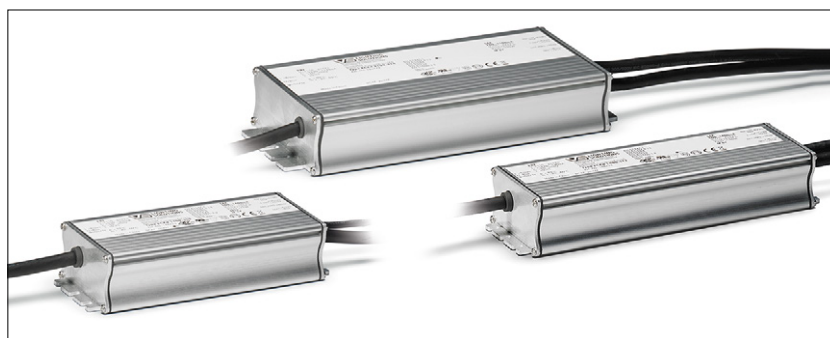
- Secondary side switching of LED modules is not allowed.

Dimming

- Dimming range: 10 to 100% (see page 15)
- Dimming to OFF is programmable
- If no dimming interface is connected, brightness will stay at 100%.
- It is also possible to choose the smart time dim function which allows to set up to 5 different dim levels.

Programmability

- The output current can be freely adjusted in 1 mA steps between the min. and max. current.
- An iProgrammer Streetlight (Ref. No. 186780) and a PC running the respective VS software are required for programming purposes.
- For programming the input voltage has to be switched off. It is not necessary to connect the LED module.



Safety features

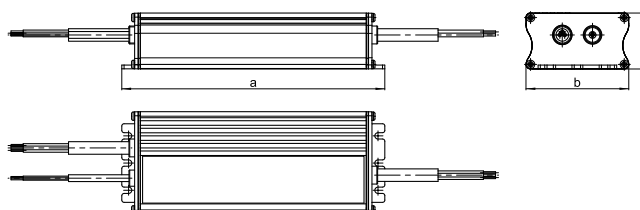
- Protection against transient main peaks: up to 6 kV (between L–N and L/N–PE)
- Electronic short-circuit protection
- Overload protection
- Overtemperature protection
- Protection against "no load" operation
- Degree of protection: IP66/IP67
- Protection class I
- SELV (only 186774)

Packaging units

Ref. No.	Packaging unit		
	Pieces per box	Boxes per pallet	Weight g
186774	1	480	850
186775	1	480	850
186776	1	300	1180
186777	1	300	1230
186778	1	300	1230
186779	1	252	1800

Dimensions

Ref. No.	Casing	Length a mm	Width b mm	Height c mm
186774	M62	174	68	37
186775	M62	174	68	37
186776	M63	220	68	37
186777	M64	240	68	37
186778	M64	240	68	37
186779	M64.1	240	100	38



Applied standards

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



Dimming

Analogue

1–10V

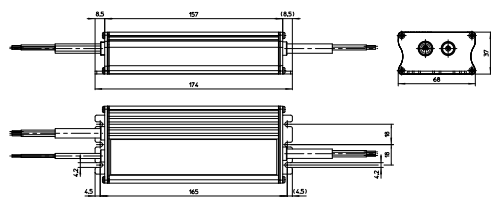
Product guarantee

- 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.

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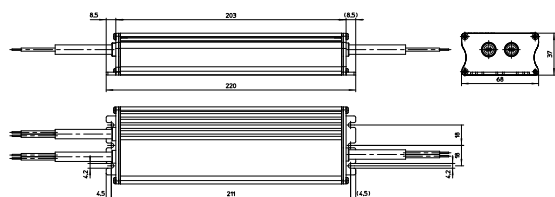
Product drawings and photos

M62



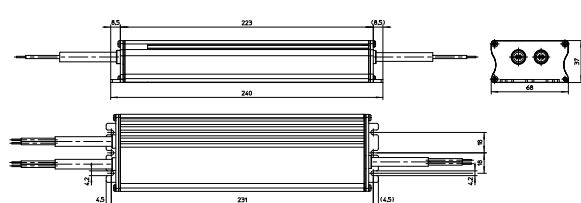
M62 – 186774, 186775

M63



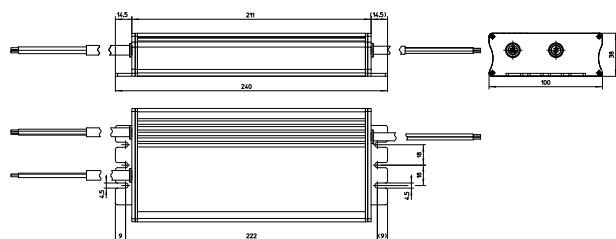
M63 – 186776

M64



M64 – 186777, 186778

M64.1



M64.1 – 186779

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LED Drivers – ComfortLine Prog S-HSP 110 V 1–10 V IP

Electrical characteristics

Max. output W	Type	Ref. No.	Voltage 50–60 Hz V	Mains current mA	Inrush current at 230 V A / μ s	Current output DC mA ($\pm 5\%$)	Factory setting mA	Voltage output DC V ($\pm 1\%$)	THD %	Efficiency at full load % (230 V)	Ripple 100 Hz %
75	ECXd 1400.309	186774	110–277	800–300	65 / 250	500–1400	700	36–107	< 20	92	≤ 5
100	ECXd 1400.310	186775	110–277	1040–360	65 / 250	600–1400	700	47–143	< 20	93	≤ 5
150	ECXd 1400.311	186776	110–277	1670–540	110 / 250	600–1400	700	72–214	< 20	93	≤ 5
200	ECXd 1400.312	186777	110–277	2100–720	180 / 200	600–1400	1050	75–190	< 20	94	≤ 5
250	ECXd 1400.313	186778	110–277	2600–900	140 / 150	700–1400	1050	90–238	< 20	95	≤ 5
320	ECXd 2100.314	186779	110–277	3230–1155	90 / 250	700–2100	1400	90–225	< 20	95	≤ 5

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.		
186774, 186775, 186776	–40	+60	10	90	–40	+85	5	95	+85	IP66/IP67
186777	–40	+60							+90	
186778	–40	+55							+90	
186779	–40	+50							+90	

Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No.	
Max.	80 °C	70 °C
hrs.	50,000	100,000

Product labels

PRI $U_i = 110...277V \sim$ $I_i = 830...300mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 85^\circ C$ $t_a = -40...60^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 1400.309 Ref.-No. 186774	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 500...1400mA $U = 36...107V \sim$ $U_{max} = 120V \sim$ $P_{max} = 75W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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PRI $U_i = 110...277V \sim$ $I_i = 1040...360mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 85^\circ C$ $t_a = -40...60^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 1400.310 Ref.-No. 186775	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 600...1400mA $U = 72...214V \sim$ $U_{max} = 250V \sim$ $P_{max} = 150W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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PRI $U_i = 110...277V \sim$ $I_i = 1670...540mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 85^\circ C$ $t_a = -40...60^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 1400.311 Ref.-No. 186776	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 600...1400mA $U = 72...214V \sim$ $U_{max} = 250V \sim$ $P_{max} = 150W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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PRI $U_i = 110...277V \sim$ $I_i = 2100...720mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 90^\circ C$ $t_a = -40...60^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 1400.312 Ref.-No. 186777	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 600...1400mA $U = 75...190V \sim$ $U_{max} = 230V \sim$ $P_{max} = 200W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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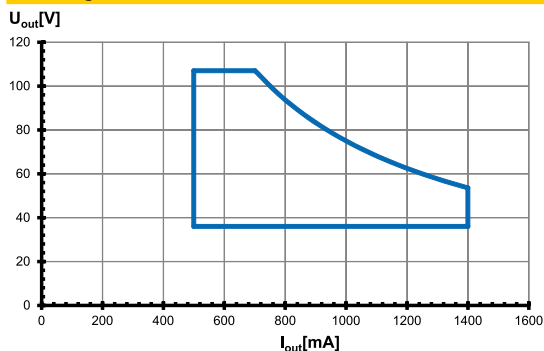
PRI $U_i = 110...277V \sim$ $I_i = 2600...900mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 90^\circ C$ $t_a = -40...55^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 1400.313 Ref.-No. 186778	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 700...1400mA $U = 90...238V \sim$ $U_{max} = 250V \sim$ $P_{max} = 250W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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PRI $U_i = 110...277V \sim$ $I_i = 3230...1155mA$ $f_i = 50...60Hz$ $\gamma > 0,95$ L = Brown N = Blue ⊕ = Gn/Ye $t_c = 90^\circ C$ $t_a = -40...55^\circ C$ Made in China ymddZ	VSLIGHTING SOLUTIONS Vossloh-Schwabe Deutschland GmbH Hohe Steinert 8, D-58509 Lüdenscheid Dimmable Electronic Converter for LED Type ECXd 2100.314 Ref.-No. 186779	EN 61347-1 EN 61347-2-13 EN 62384 EN 55015 EN 61547 EN 61000-3-2 SELV IP 66/67 NTC/PRG = Black SEC+ = Brown SEC- = Blue	SEC 700...2100mA $U = 90...225V \sim$ $U_{max} = 250V \sim$ $P_{max} = 320W$ Vaux = 12V ~ BL/Wht 50mA 1-10V+ = Purple - = Gray
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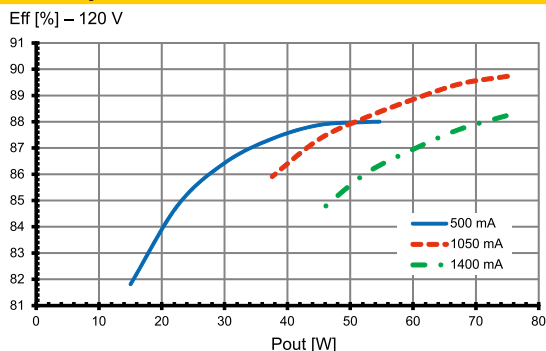
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Typ. performance graphs for 186774 / Type ECXd 1400.309

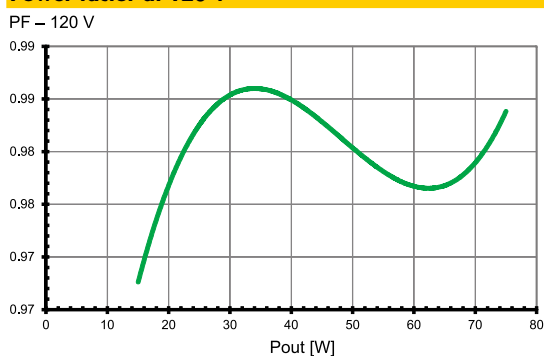
Working area



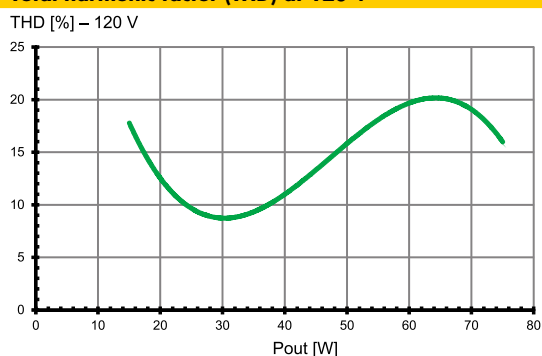
Efficiency at 120 V



Power factor at 120 V

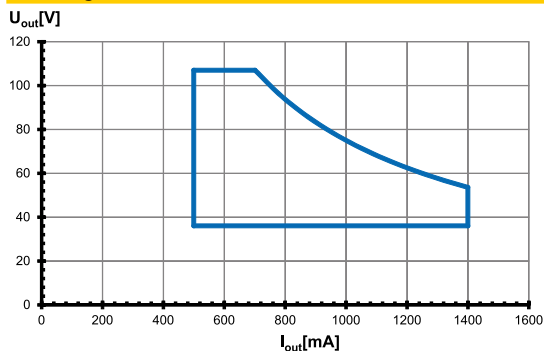


Total harmonic factor (THD) at 120 V

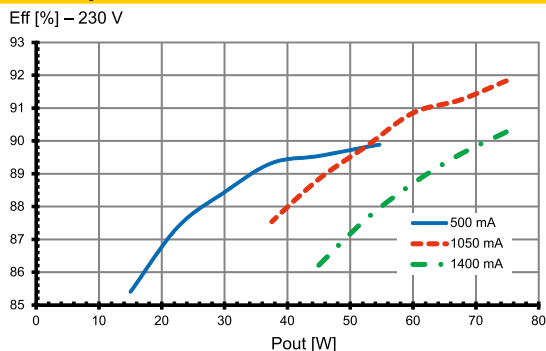


Typ. performance graphs for 186774 / Type ECXd 1400.309

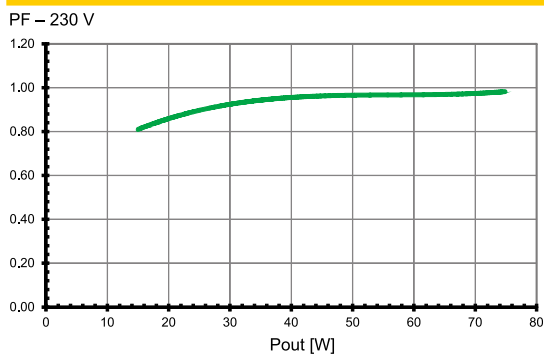
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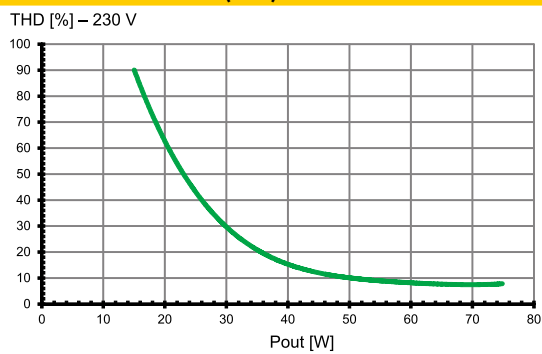
Efficiency at 230 V



Power factor at 230 V



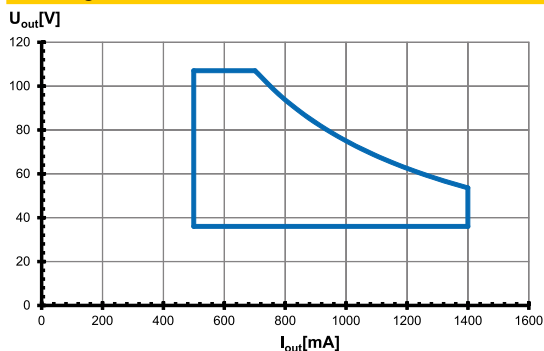
Total harmonic factor (THD) at 230 V



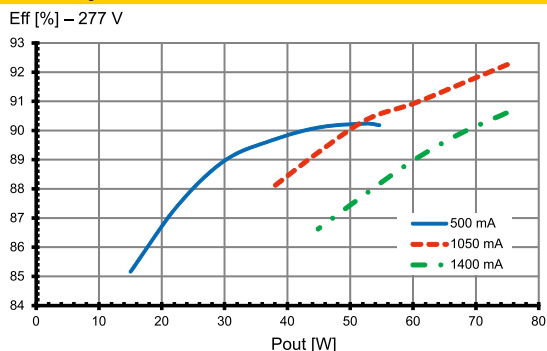
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Typ. performance graphs for 186774 / Type ECXd 1400.309

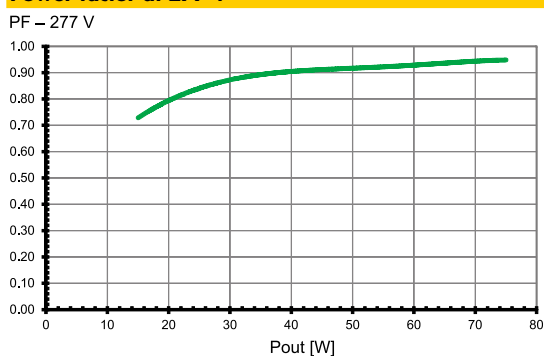
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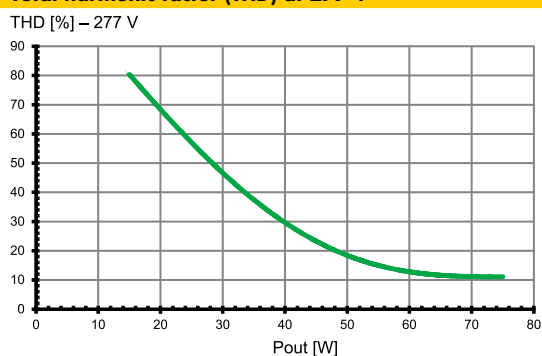
Efficiency at 277 V



Power factor at 277 V

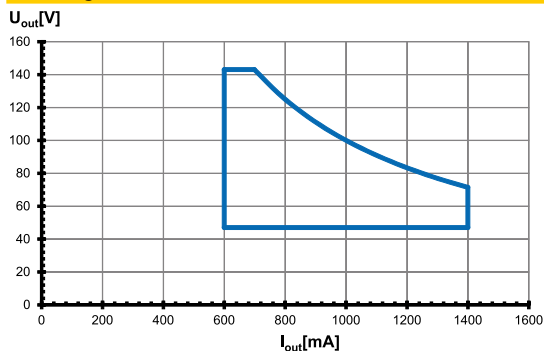


Total harmonic factor (THD) at 277 V

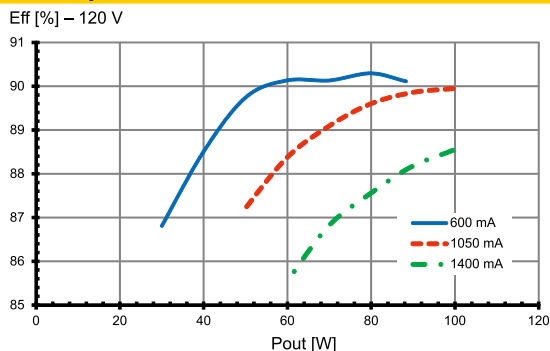


Typ. performance graphs for 186775 / Type ECXd 1400.310

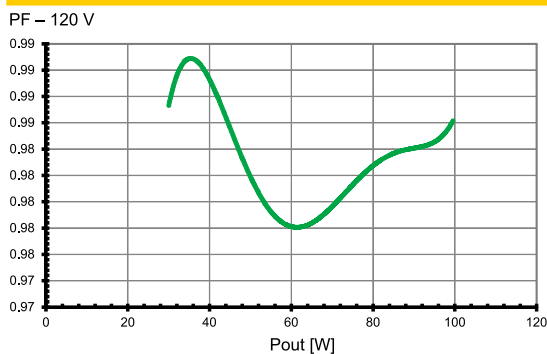
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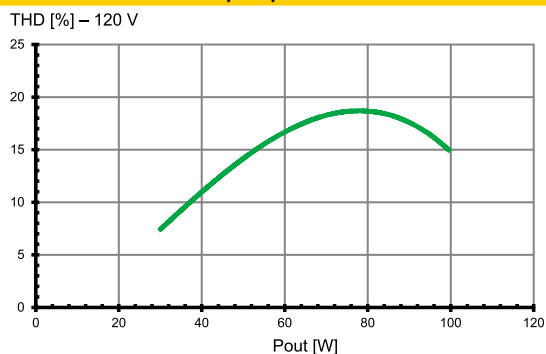
Efficiency at 120 V



Power factor at 120 V



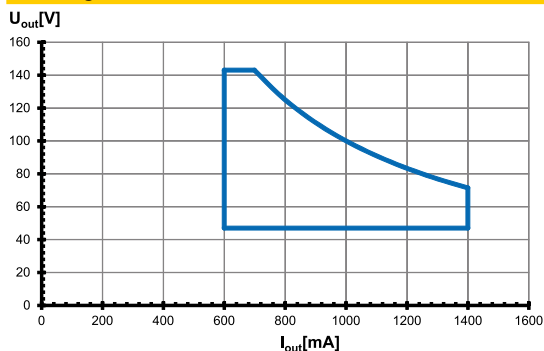
Total harmonic factor (THD) at 120 V



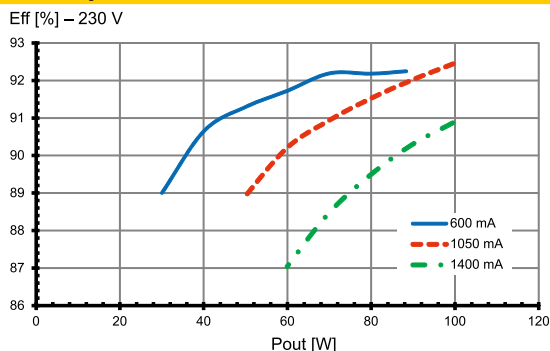
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Typ. performance graphs for 186775 / Type ECXd 1400.310

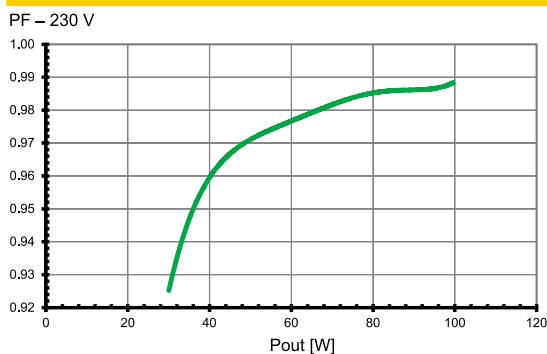
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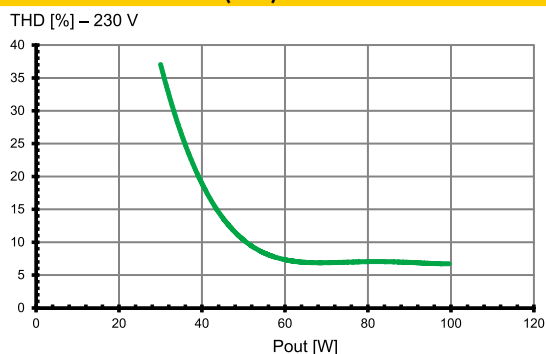
Efficiency at 230 V



Power factor at 230 V

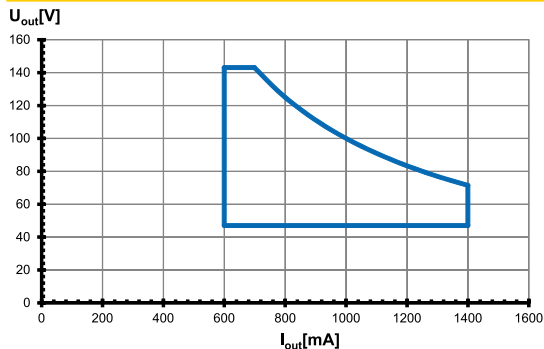


Total harmonic factor (THD) at 230 V

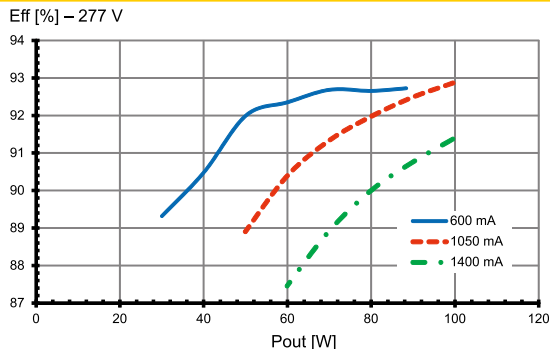


Typ. performance graphs for 186775 / Type ECXd 1400.310

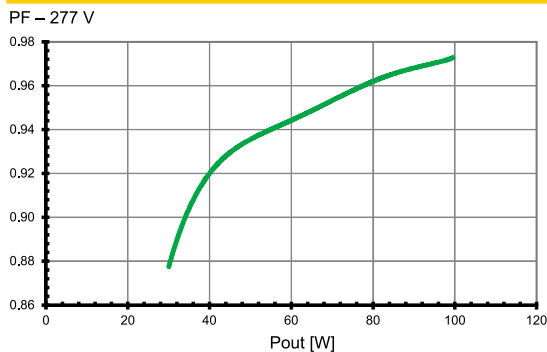
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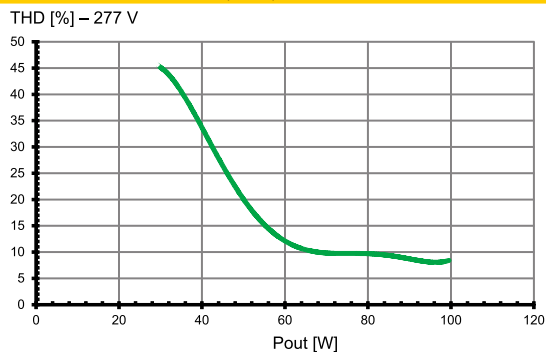
Efficiency at 277 V



Power factor at 277 V



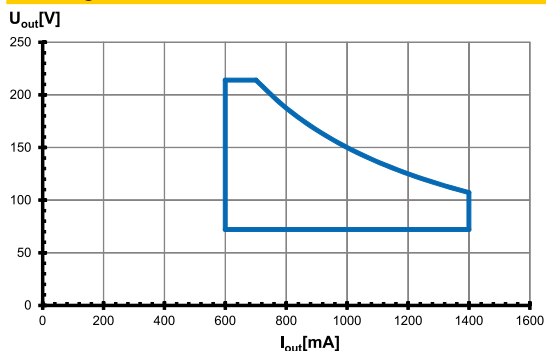
Total harmonic factor (THD) at 277 V



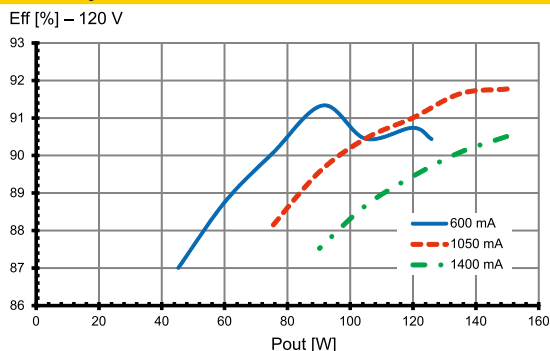
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Typ. performance graphs for 186776 / Type ECXd 1400.311

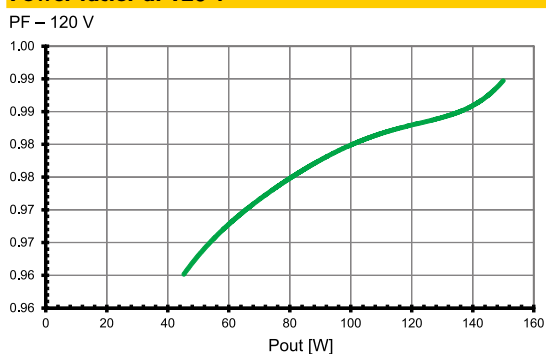
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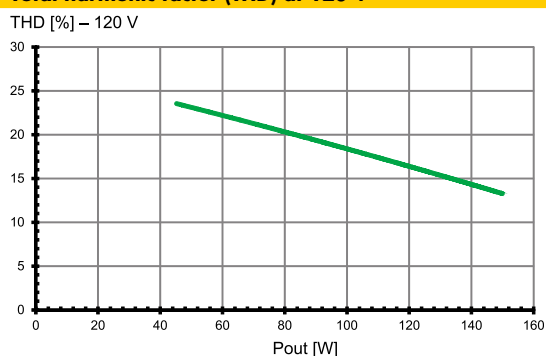
Efficiency at 120 V



Power factor at 120 V

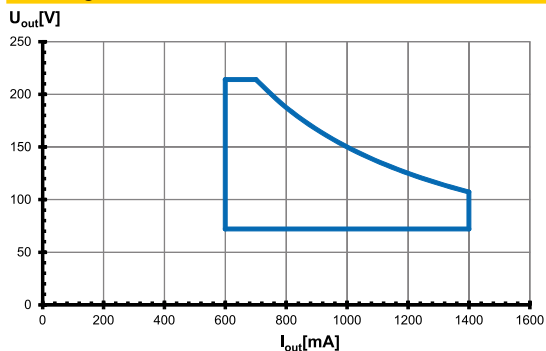


Total harmonic factor (THD) at 120 V

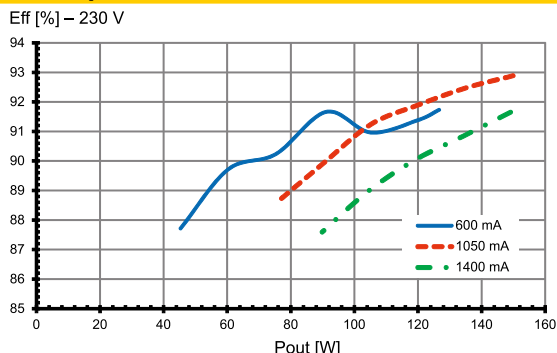


Typ. performance graphs for 186776 / Type ECXd 1400.311

Working area



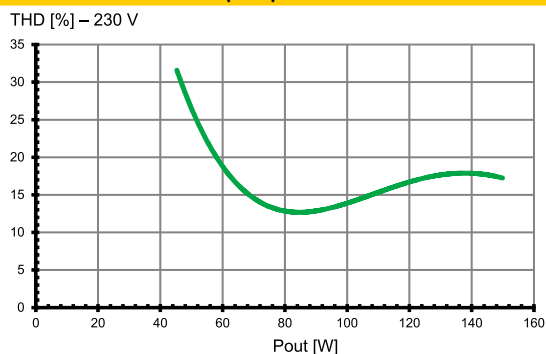
Efficiency at 230 V



Power factor at 230 V



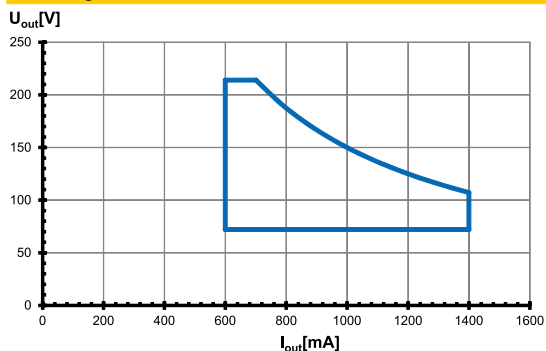
Total harmonic factor (THD) at 230 V



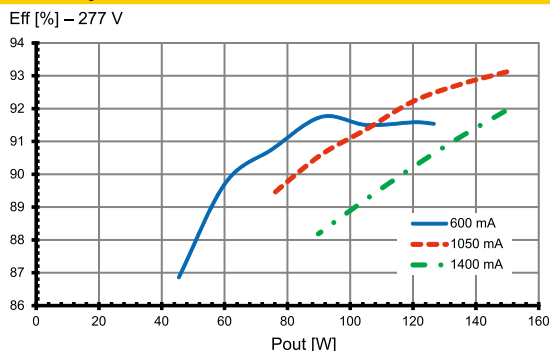
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Typ. performance graphs for 186776 / Type ECXd 1400.311

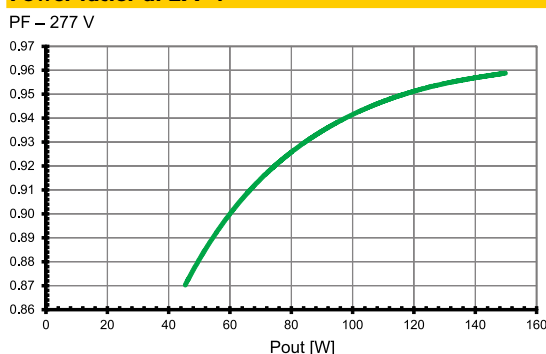
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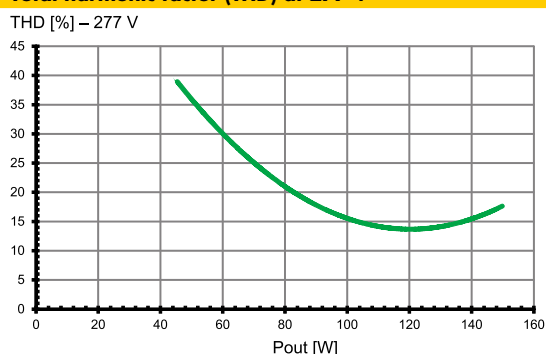
Efficiency at 277 V



Power factor at 277 V

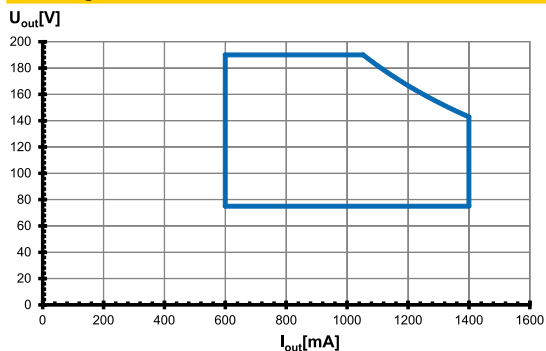


Total harmonic factor (THD) at 277 V

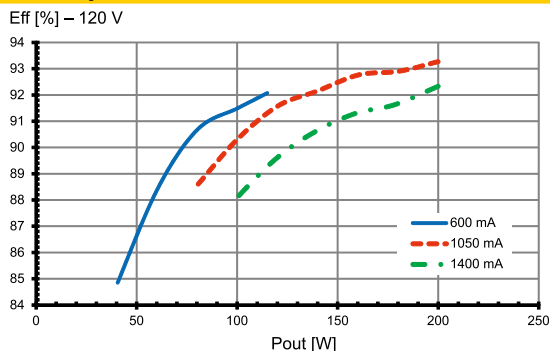


Typ. performance graphs for 186777 / Type ECXd 1400.312

Working area



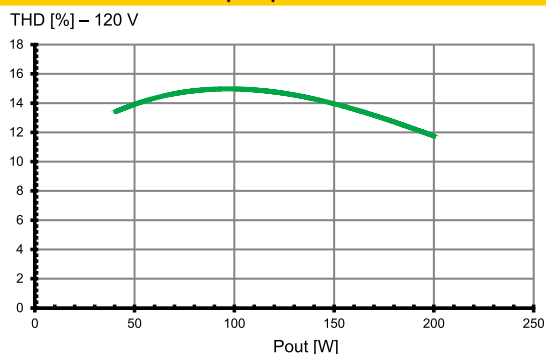
Efficiency at 120 V



Power factor at 120 V



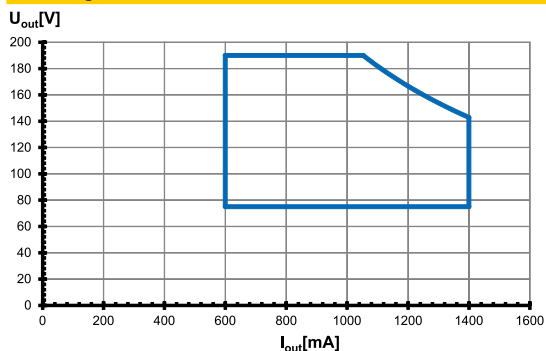
Total harmonic factor (THD) at 120 V



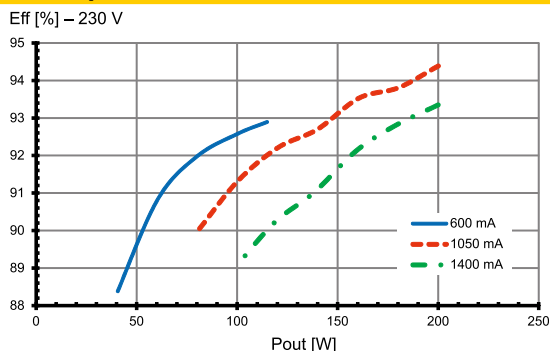
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Typ. performance graphs for 186777 / Type ECXd 1400.312

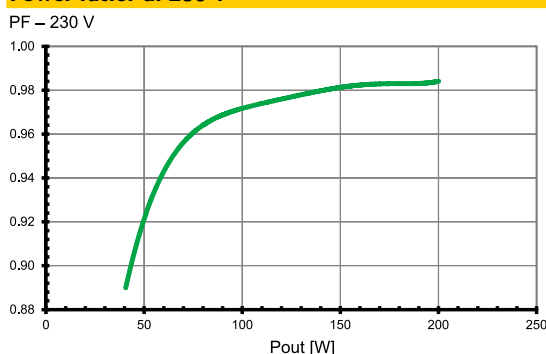
Working area



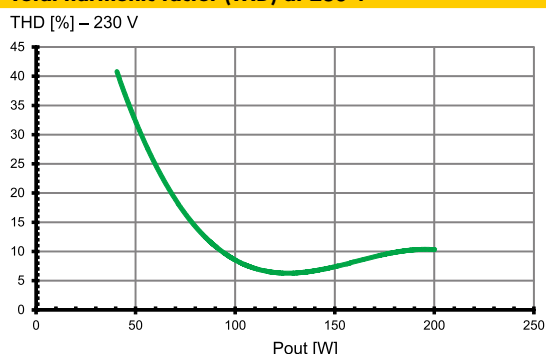
Efficiency at 230 V



Power factor at 230 V

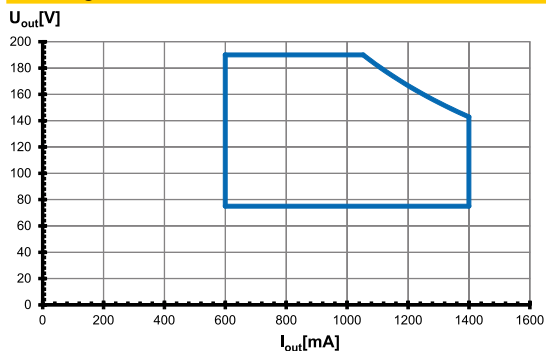


Total harmonic factor (THD) at 230 V

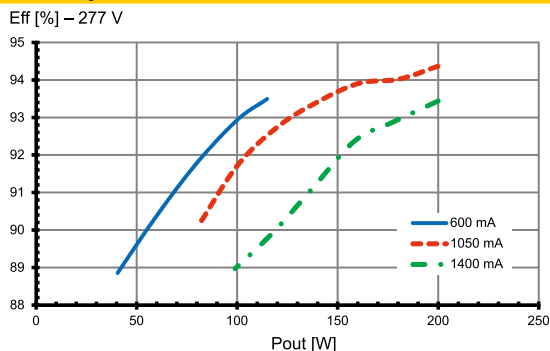


Typ. performance graphs for 186777 / Type ECXd 1400.312

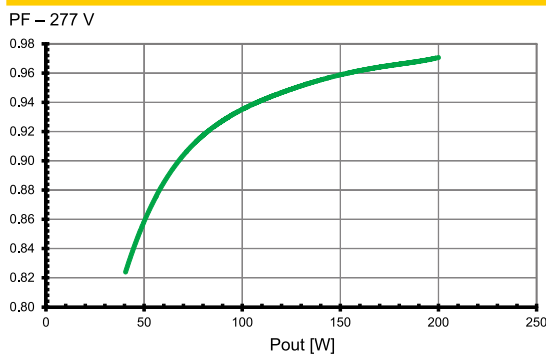
Working area



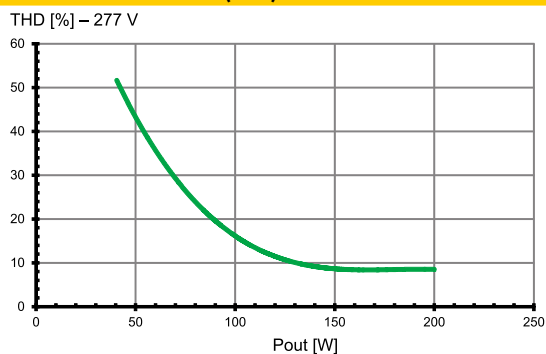
Efficiency at 277 V



Power factor at 277 V



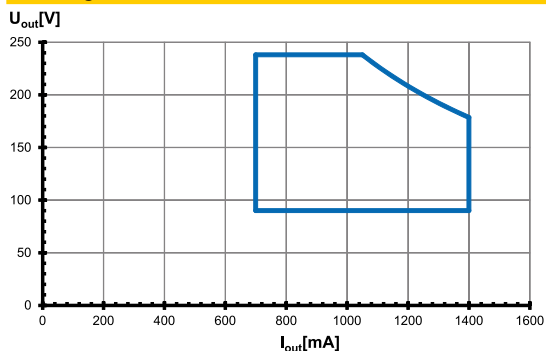
Total harmonic factor (THD) at 277 V



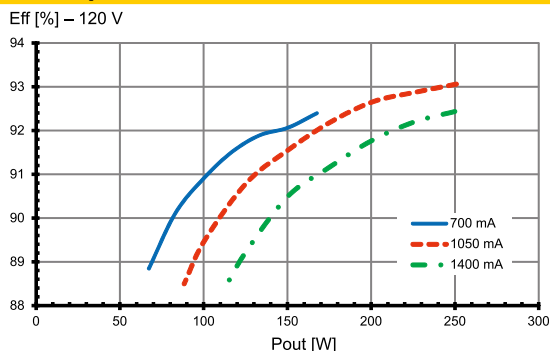
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Typ. performance graphs for 186778 / Type ECXd 1400.313

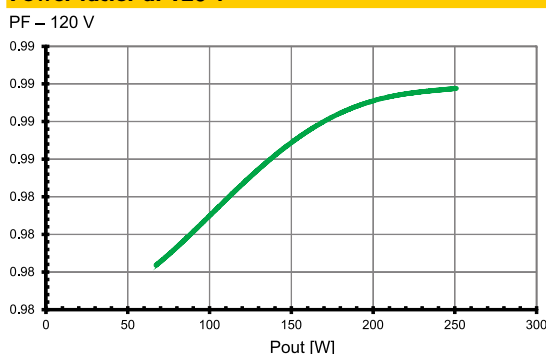
Working area



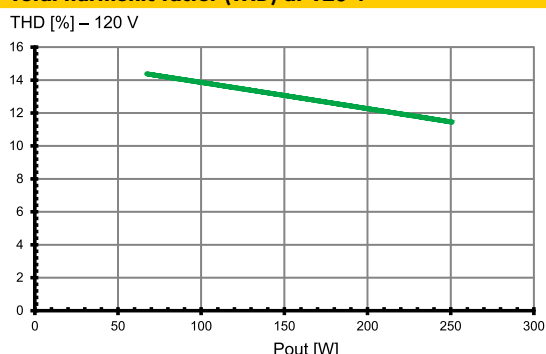
Efficiency at 120 V



Power factor at 120 V

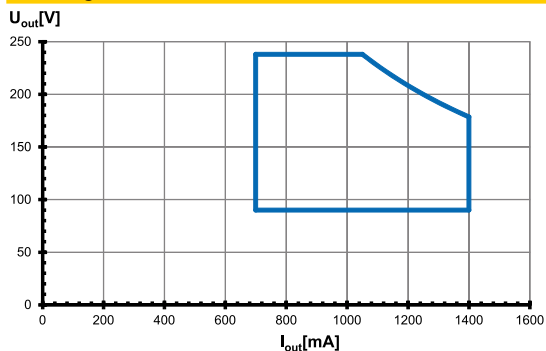


Total harmonic factor (THD) at 120 V

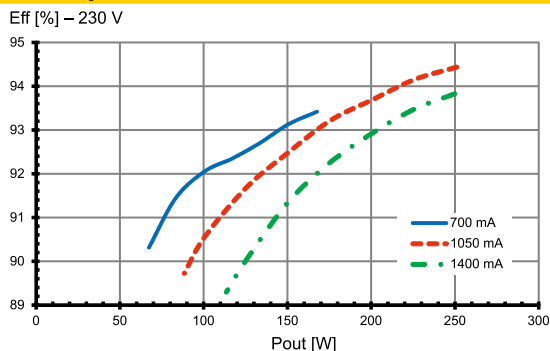


Typ. performance graphs for 186778 / Type ECXd 1400.313

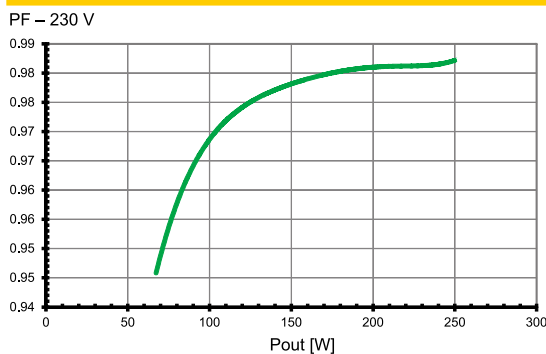
Working area



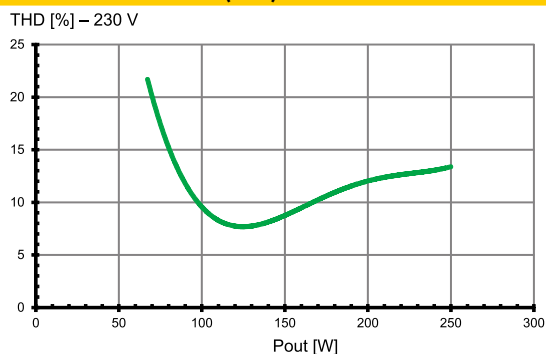
Efficiency at 230 V



Power factor at 230 V



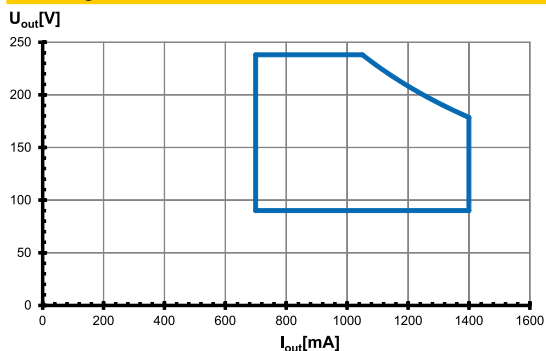
Total harmonic factor (THD) at 230 V



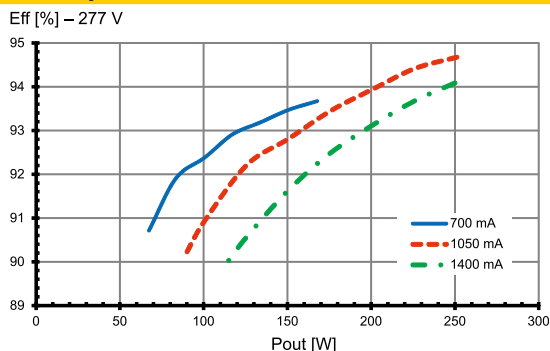
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Typ. performance graphs for 186778 / Type ECXd 1400.313

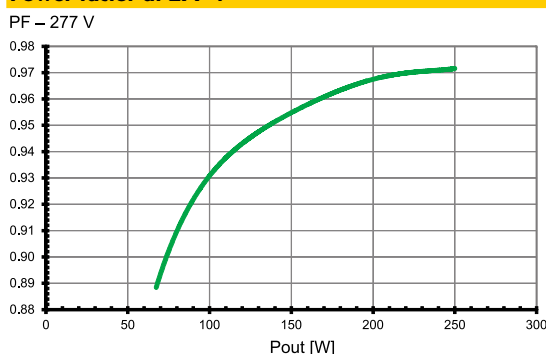
Working area



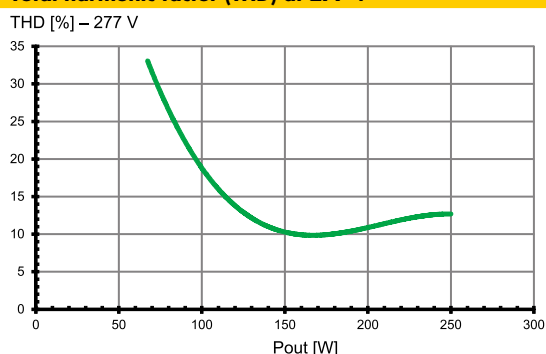
Efficiency at 277 V



Power factor at 277 V

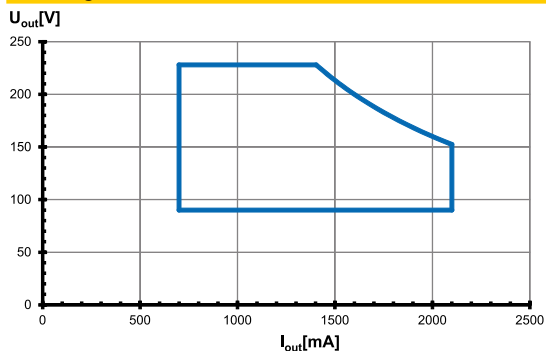


Total harmonic factor (THD) at 277 V

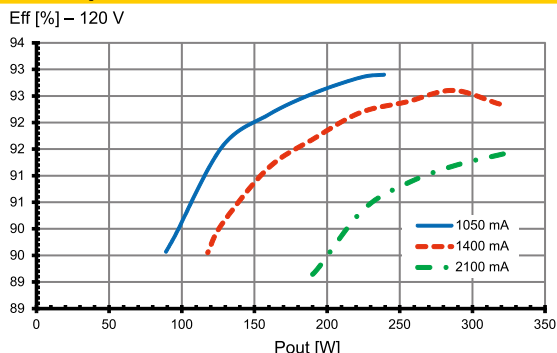


Typ. performance graphs for 186779 / Type ECXd 2100.314

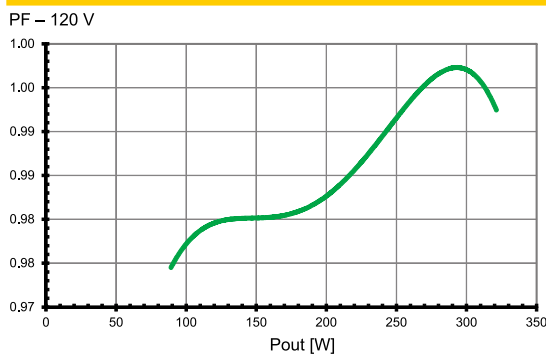
Working area



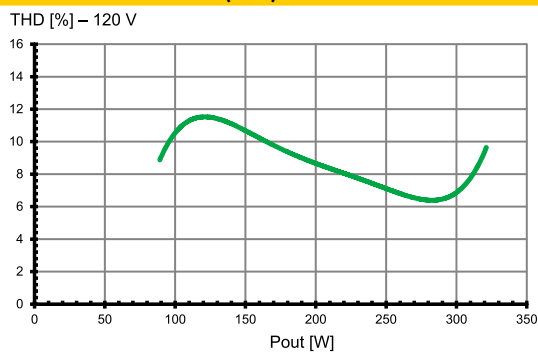
Efficiency at 120 V



Power factor at 120 V



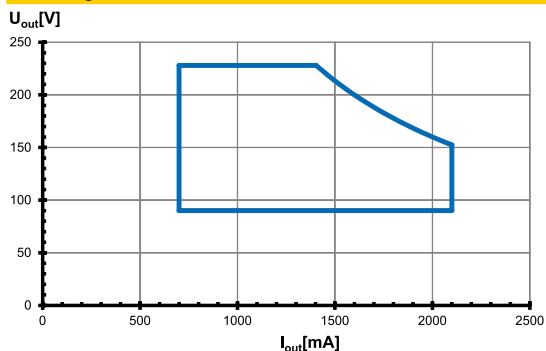
Total harmonic factor (THD) at 120 V



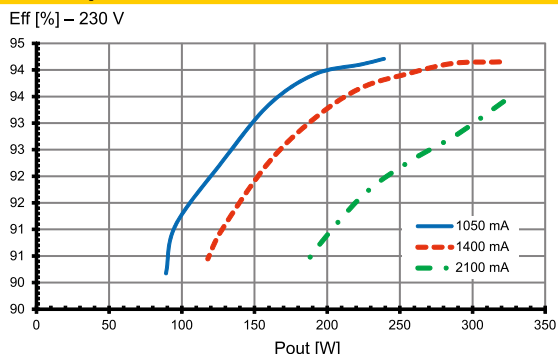
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Typ. performance graphs for 186779 / Type ECXd 2100.314

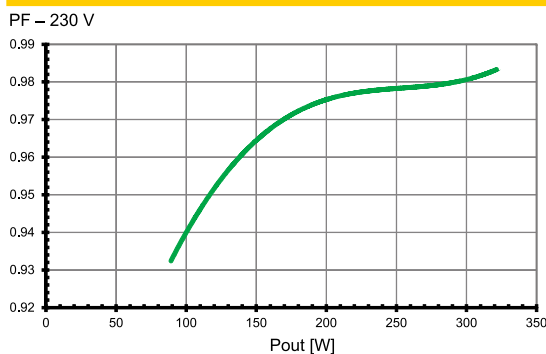
Working area



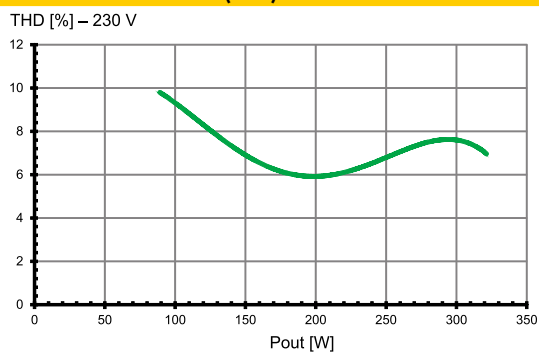
Efficiency at 230 V



Power factor at 230 V

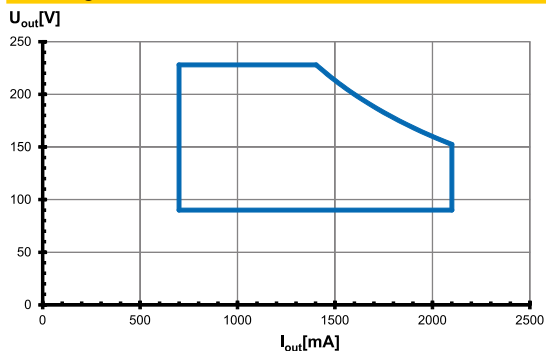


Total harmonic factor (THD) at 230 V

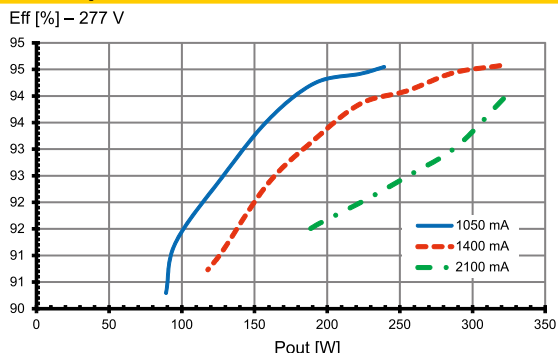


Typ. performance graphs for 186779 / Type ECXd 2100.314

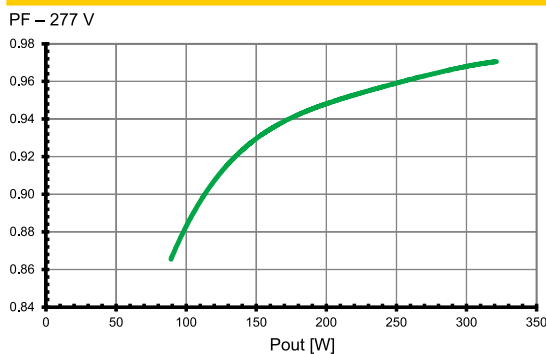
Working area



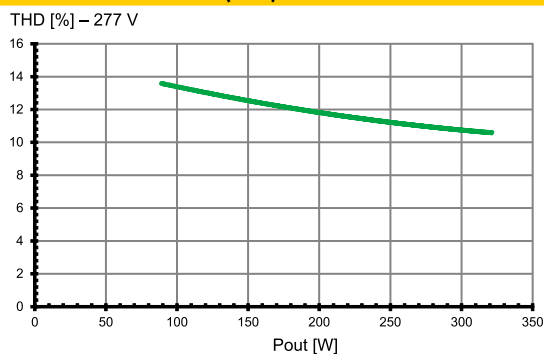
Efficiency at 277 V



Power factor at 277 V



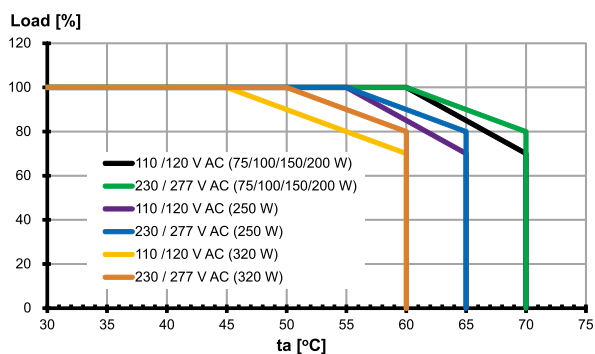
Total harmonic factor (THD) at 277 V



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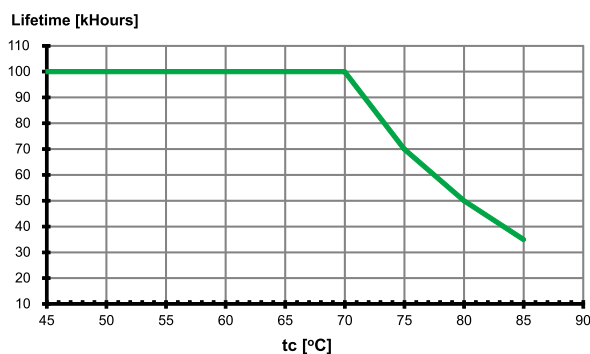
Load derating

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

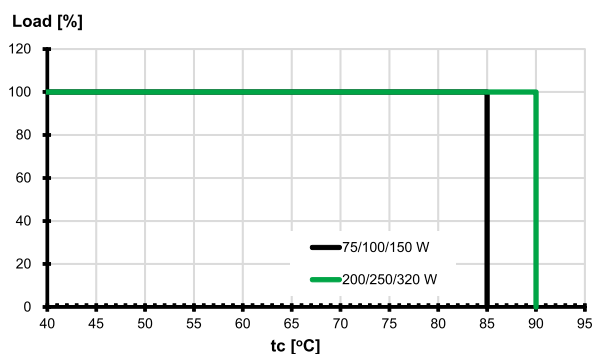


Lifetime

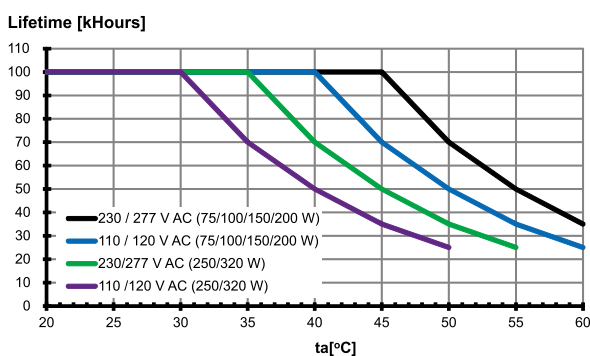
Lifetime (in 1000 hrs.) vs. Casing temperature t_c (°C)



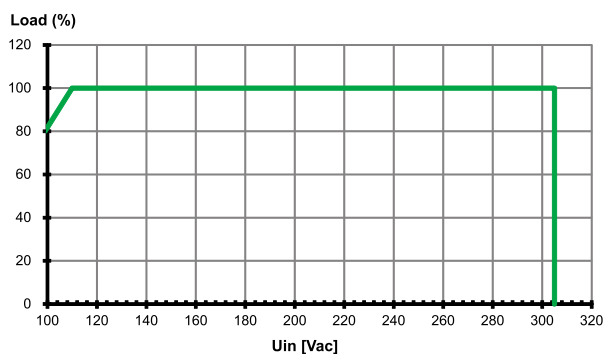
Load (%) vs. Casing temperature t_c (°C)



Lifetime (in 1000 hrs.) vs. Ambient temperature t_a (°C) without load derating



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



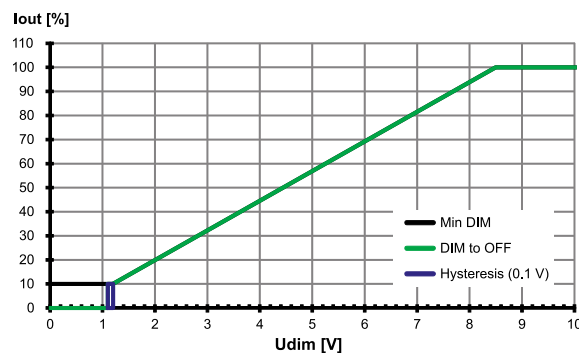
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Safety functions

- Transient mains peaks protection:
Values are in compliance with EN 61547 (interference immunity).
Surges between L–N and L/N–PE: up to 6 kV
It is possible to increase the protection up to 10 kV with our separate available surge protection devices:
– for luminaires of protection class I: 142738 / 142742
– for IP66 luminaires of protection class I: 142748
– for luminaires of protection class II: 142737
- 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. Automatic restart when the fault is removed.
Please check before switch-on mains power supply that the selected LED load is suitable (see Electrical Characteristics on data sheet).
- Overheating:
The control gears have overheating protection.
In case of overheating the control gear will reduce the output current.
Automatic restart when the fault is removed.
- 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.

Dimming

- Minimum output: 100 mA or 10% of selected output current
Lower than 1.1 V (± 0.1 V) dim to off is programmable with 0.1 V hysteresis
- 1–10 V source current: 200 μ A \pm 50 μ A
- Dimming current tolerance: $\pm 10\%$ of max. set output current, for example $I_{OUT} = 1000$ mA; tolerance = ± 100 mA



NTC for thermal protection of the LED module

The LEDs can be thermally protected by the driver's NTC (Negative Temperature Coefficient resistor) interface, which ensures the output current will be reduced when a critical temperature is reached. Connect an NTC on the LED module to the LED driver associated wires as shown in the wiring diagram.

- Max. NTC resistance: 30 k Ω
- Derating start between 30 k Ω and 5 k Ω
- Derating end between 30 k Ω and 0 k Ω

12 V Auxillary

- Output voltage: +12 V DC \pm 10%
- Output current: 50 mA
- Max. output power: 0.6 W

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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

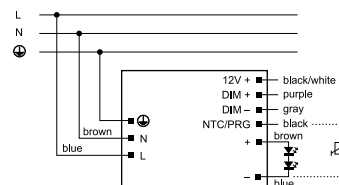
Mechanical mounting

- Mounting position: Independent application: Drivers with integrated cord grip 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 luminaire with water protection rate ≥ 4 (e.g. IP54 required).
- Degree of protection: IP66/IP67
- 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

- 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 for independent drivers: 1 m
- Polarity: Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- Parallel connection: At secondary side is not allowed.
- 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		B 10 A	B 13 A	B 16 A	B 20 A
ECXd 1400.309	186774	4	5	6	8
ECXd 1400.310	186775	4	5	6	8
ECXd 1400.311	186776	2	3	3	4
ECXd 1400.312	186777	1	2	2	3
ECXd 1400.313	186778	1	2	2	3
ECXd 2100.314	186779	1	1	1	2
Automatic cut-out type C		C 10 A	C 13 A	C 16 A	C 20 A
ECXd 1400.309	186774	6	8	10	13
ECXd 1400.310	186775	6	8	10	13
ECXd 1400.311	186776	4	5	6	8
ECXd 1400.312	186777	3	4	4	6
ECXd 1400.313	186778	2	3	4	5
ECXd 2100.314	186779	2	3	3	4

- 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.

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