

ComfortLine LEDSet L-R3

Product features

- Linear casing shape

Functions

- Selectable current output by secondary side LEDSet terminal.
- The output current can be freely adjusted between 100 mA and 800 mA by using a resistor (according LEDSet standard).
- LEDSet resistor ist not included.
- Suitable for central battery system for emergency lighting acc. to EN 50172

Electrical features

- Mains voltage: 220–240 V \pm 10%
- Mains frequency: 50–60 Hz
- DC operation: 198–276 V, 0 Hz
- Push-in terminals: 0.2–1.5 mm²
- Power factor at full load
186585, 186586: > 0.96
186587, 186588: > 0.98
- Max. working voltage (U_{OUT}): 250 V
- Secondary side switching of LED modules is not allowed.

Safety features

- Protection against transient main peaks up to 1 kV (between L and N) and up to 2 kV (between L/N and PE)
- Electronic short-circuit protection
- Overtemperature protection
- Protection against "no load" operation
- Degree of protection: IP20
- Protection class I

Packaging units

| Ref. No. | Packaging unit | | |
|----------|----------------|------------------|----------|
| | Pieces per box | Boxes per pallet | Weight g |
| 186585 | 30 | 64 | 180 |
| 186586 | 30 | 64 | 190 |
| 186587 | 30 | 64 | 183 |
| 186588 | 30 | 64 | 190 |



Applied standards

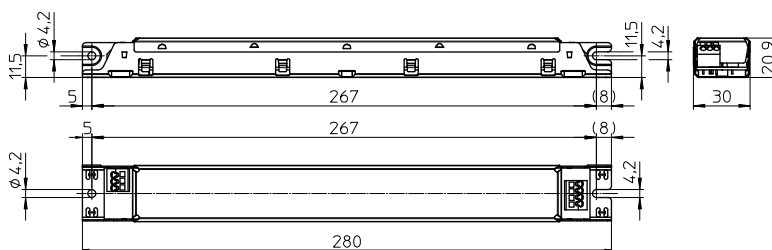
- EN 61347-1
- EN 61347-2-13
- EN 61547
- EN 61000-3-2
- EN 62384
- EN 55015



Dimensions

- Casing: M7.1
- Length: 280 mm
- Width: 30 mm
- Height: 21 mm

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.

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 % |
|---------------|--------------|---------------|--------------------|------------------|----------------------------|----------------------------------|-----------------------|----------------------------|-----------------------------------|-----------------|
| 40 | ECXe 400.223 | 186585 | 220–240 | 210–190 | 21.7 / 135 | 100–400 | 30–120 | < 19.5 | > 90 | < 2 |
| 40 | ECXe 800.224 | 186586 | 220–240 | 210–200 | 36.9 / 245 | 400–800 | 30–70 | < 17 | > 93 | < 0.9 |
| 85 | ECXe 400.225 | 186587 | 220–240 | 410–380 | 32.6 / 194 | 100–400 | 100–225 | < 9.8 | > 94 | < 1.3 |
| 85 | ECXe 800.226 | 186588 | 220–240 | 420–390 | 36.9 / 245 | 400–800 | 30–130 | < 16.5 | > 93 | < 0.9 |

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. | | |
| 186585 | -25 | +60 | 5 | 60 | -40 | +85 | 5 | 95 | +70 | IP20 |
| 186586 | -25 | +50 | | | | | | | +75 | |
| 186587 | -25 | +50 | | | | | | | +65 | |
| 186588 | -25 | +50 | | | | | | | +75 | |

Expected service life time

at operation temperatures at t_c point

| Operation current | Ref. No. | | | | | |
|-------------------|----------|--------|----------------|--------|---------|--------|
| | 186585 | | 186586, 186588 | | 186587 | |
| All | 60 °C | 70 °C | 65 °C | 75 °C | 55 °C | 65 °C |
| hrs. | 100,000 | 50,000 | 100,000 | 50,000 | 100,000 | 50,000 |

Safety functions

- Transient mains peaks protection:
Values are in compliance with EN 61547 (interference immunity).
Surges between L-N: up to 1 kV
Surges between L/N-PE: up to 2 kV
- 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.
Please check before switch-on mains power supply that the selected LED load is suitable (see Electrical Characteristics on data sheet).
- Overheating: The control gear has overheating protection acc. to IEC 61347-1 C 5e.
In case of overheating the control gear will shut down. For restart switch of the mains for 1 min. and start again.
- 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.

DC and emergency lighting operation

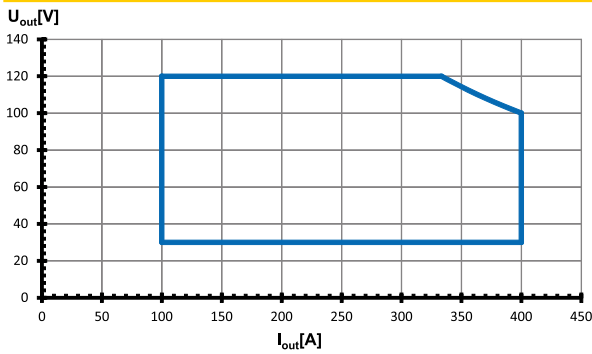
The control gears are suitable for direct voltage operation (DC). Reliable DC operation is guaranteed if the specified working area of LED driver is maintained.

- Light level at DC operation (EOFx):
100% (not adjustable)
- DC range: 198–276 V
- Reducing to 176 V: With reduced service life time possible
- DC operation: 3 hrs. (acc. to EN 50172)

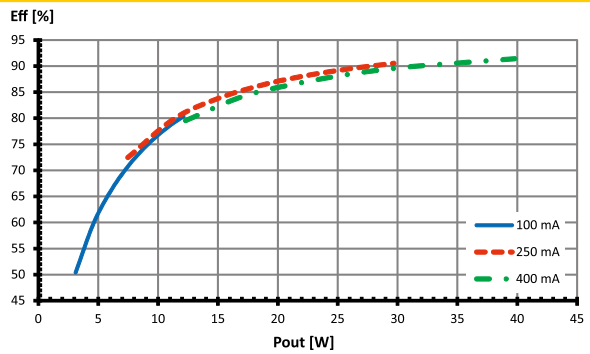
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Typ. performance graphs for 186585 / Type ECXe 400.223

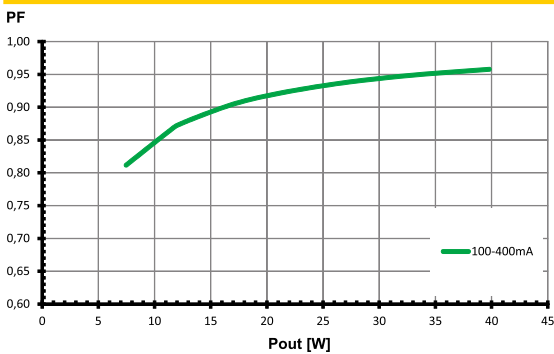
Working area



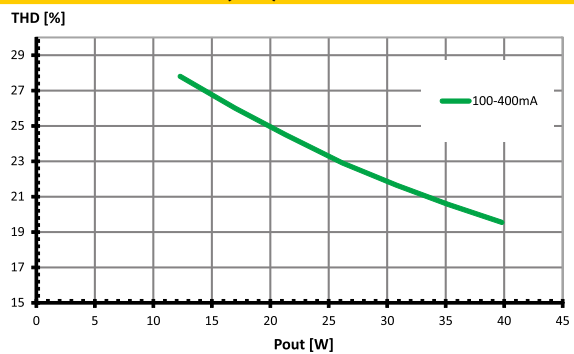
Efficiency



Power factor

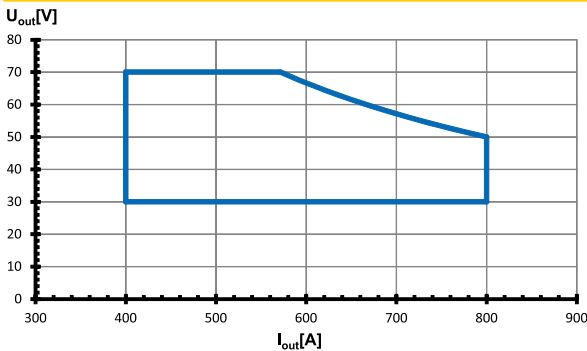


Total harmonic factor (THD)

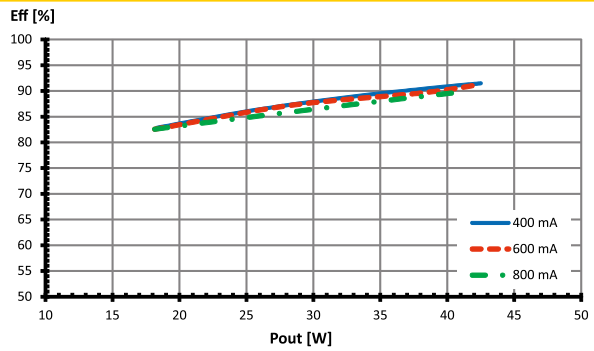


Typ. performance graphs for 186586 / Type ECXe 800.224

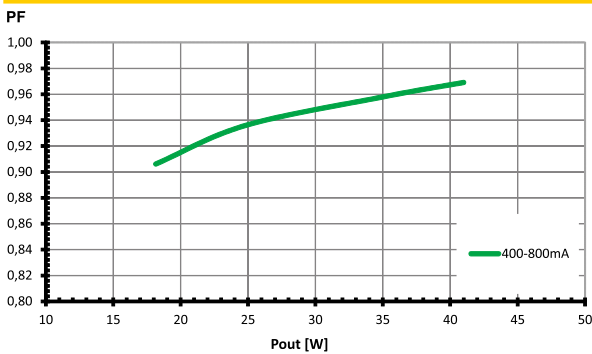
Working area



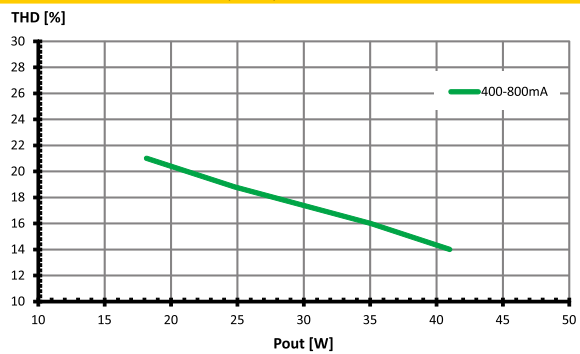
Efficiency



Power factor



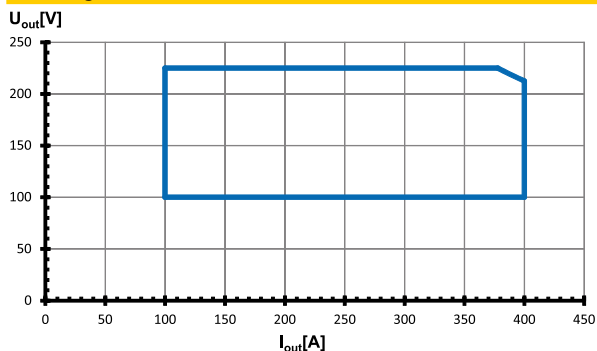
Total harmonic factor (THD)



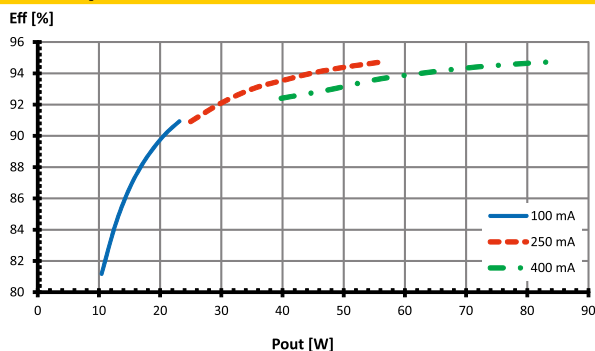
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Typ. performance graphs for 186587 / Type ECXe 400.225

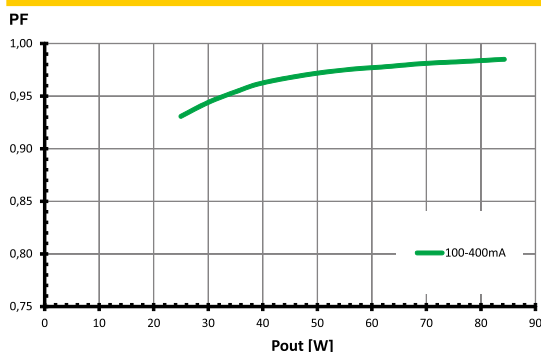
Working area



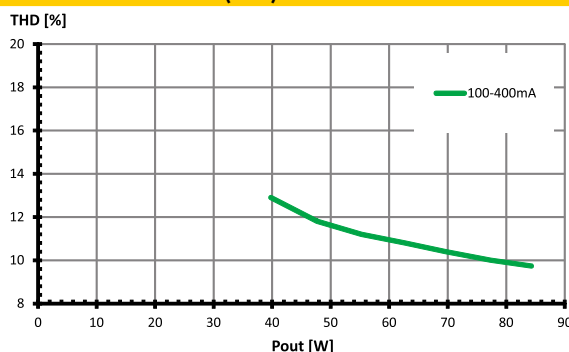
Efficiency



Power factor

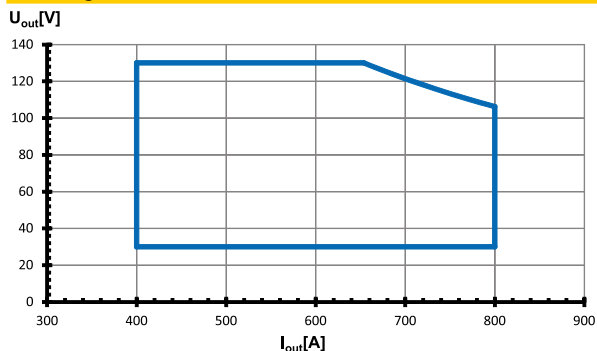


Total harmonic factor (THD)

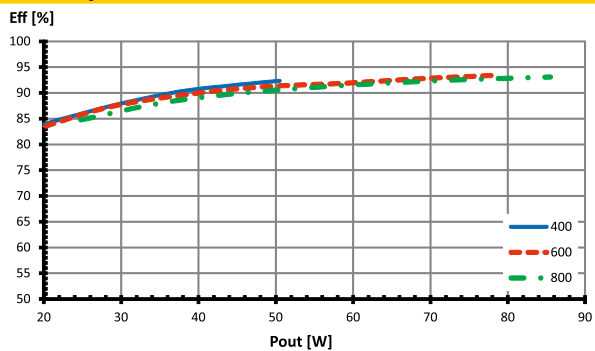


Typ. performance graphs for 186588 / Type ECXe 800.226

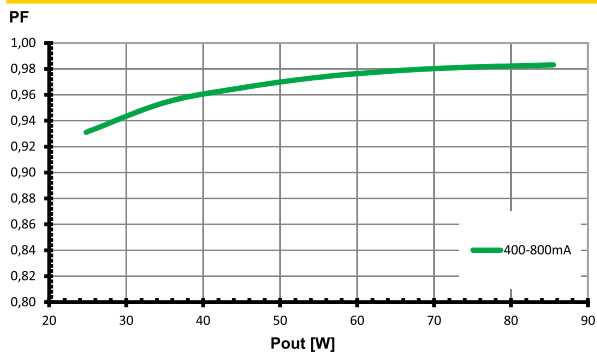
Working area



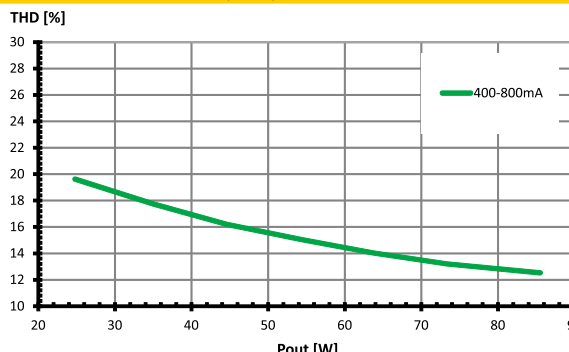
Efficiency



Power factor



Total harmonic factor (THD)



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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

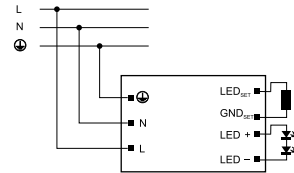
Mechanical mounting

- Mounting position: Built-in: Any position inside a luminaire is allowed
Independent application: Drivers are not allowed to use for independent applications
- 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 ≥ 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 0.2–1.5 mm²
- Stripped length: 8.5–10 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 m Ω (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. | | |
|---------------------------------|---------------|--|--------|--------|
| | | B 10 A | B 13 A | B 16 A |
| Automatic cut-out type B | | | | |
| ECXe 400.223 | 186585 | 28 | 37 | 45 |
| ECXe 800.224 | 186586 | 8 | 11 | 14 |
| ECXe 400.225 | 186587 | 12 | 16 | 20 |
| ECXe 800.226 | 186588 | 8 | 11 | 14 |
| Automatic cut-out type C | | | | |
| ECXe 400.223 | 186585 | 40 | 52 | 64 |
| ECXe 800.224 | 186586 | 14 | 19 | 23 |
| ECXe 400.225 | 186587 | 20 | 26 | 32 |
| ECXe 800.226 | 186588 | 14 | 19 | 23 |

- 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.

Choice of LEDSet Resistor

Output current selection:

- The output current can be adapted within the rated output current range
 - between 100 and 400 mA for ECXe 400.223 and ECXe 400.225 and
 - between 400 and 800 mA for ECXe 800.224 and ECXe 800.226.
- To change the output current it is necessary to use the correct LEDSet resistor. Values for different currents are figured out in the table below.
- The LEDSet resistor should have a maximum tolerance of 1%.
- Please refer to the electrical values and the operating window to see which combinations are possible.
- Output current / needed LEDSet resistor can be calculated as follows:

$$I_{OUT} = 5V/R_{set} \times 1000$$

$$R_{set} = 5V/I_{OUT} \times 1000$$

- If no LEDSet resistor is mounted (delivery condition) output current is less than nominal I_{min} .
- If LEDSet interface is short circuit output current is limited to I_{max} .

| Resistors | | ECXe 400.223 | | | | ECXe 400.225 | | | |
|--------------------------------------|---------------------|---------------------------------|--------|-----------------------------------|--------|---------------------------------|--------|-----------------------------------|--------|
| Nominal current I_{rated} mA | Resistor R kΩ | LED output voltage U_{LED} | | LED nominal output P_{rated} | | LED output voltage U_{LED} | | LED nominal output P_{rated} | |
| | | V min. | V max. | W min. | W max. | V min. | V max. | W min. | W max. |
| 100 | 50 | 30 | 120 | 3 | 12 | 100 | 225 | 10 | 22.5 |
| 125 | 40 | 30 | 120 | 3.75 | 15 | 100 | 225 | 12.5 | 28.1 |
| 150 | 33.33 | 30 | 120 | 4.5 | 18 | 100 | 225 | 15 | 33.75 |
| 175 | 28.57 | 30 | 120 | 5.25 | 21 | 100 | 225 | 17.5 | 39.4 |
| 200 | 25 | 30 | 120 | 6 | 24 | 100 | 225 | 20 | 45 |
| 225 | 22.22 | 30 | 120 | 6.75 | 27 | 100 | 225 | 22.5 | 50.6 |
| 250 | 20 | 30 | 120 | 7.5 | 30 | 100 | 225 | 25 | 56.25 |
| 275 | 18.18 | 30 | 120 | 8.25 | 33 | 100 | 225 | 27.5 | 61.9 |
| 300 | 16.67 | 30 | 120 | 9 | 36 | 100 | 225 | 30 | 67.5 |
| 325 | 15.39 | 30 | 120 | 9.75 | 39 | 100 | 225 | 32.5 | 73.1 |
| 350 | 14.29 | 30 | 114 | 10.5 | 40 | 100 | 225 | 35 | 78.75 |
| 375 | 13.33 | 30 | 107 | 11.25 | 40 | 100 | 223 | 37.5 | 83 |
| 400 | 12.5 | 30 | 100 | 12 | 40 | 100 | 212 | 40 | 85 |
| Resistors | | ECXe 800.224 | | | | ECXe 800.226 | | | |
| 400 | 12.5 | 30 | 70 | 12 | 28 | 30 | 130 | 12 | 52 |
| 425 | 11.76 | 30 | 70 | 12.75 | 29.75 | 30 | 130 | 12.75 | 55.25 |
| 450 | 11.11 | 30 | 70 | 13.5 | 31.5 | 30 | 130 | 13.5 | 58.5 |
| 475 | 10.53 | 30 | 70 | 14.25 | 33.25 | 30 | 130 | 14.25 | 61.75 |
| 500 | 10 | 30 | 70 | 15 | 35 | 30 | 130 | 15 | 65 |
| 525 | 9.52 | 30 | 70 | 15.75 | 36.75 | 30 | 130 | 15.75 | 68.25 |
| 550 | 9.09 | 30 | 70 | 16.5 | 38.5 | 30 | 130 | 16.5 | 71.5 |
| 575 | 8.7 | 30 | 69.6 | 17.25 | 40 | 30 | 130 | 17.25 | 74.75 |
| 600 | 8.33 | 30 | 66.7 | 18 | 40 | 30 | 130 | 18 | 78 |
| 625 | 8 | 30 | 64 | 18.75 | 40 | 30 | 130 | 18.75 | 81.25 |
| 650 | 7.69 | 30 | 61.5 | 19.5 | 40 | 30 | 130 | 19.5 | 84.5 |
| 675 | 7.41 | 30 | 59.3 | 20.25 | 40 | 30 | 126 | 20.25 | 85 |
| 700 | 7.14 | 30 | 57.1 | 21 | 40 | 30 | 121 | 21 | 85 |
| 725 | 6.9 | 30 | 55.2 | 21.75 | 40 | 30 | 117 | 21.75 | 85 |
| 750 | 6.67 | 30 | 53.3 | 22.5 | 40 | 30 | 113 | 22.5 | 85 |
| 775 | 6.45 | 30 | 51.6 | 23.25 | 40 | 30 | 109 | 23.25 | 85 |
| 800 | 6.25 | 30 | 50 | 24 | 40 | 30 | 106 | 24 | 85 |