

# LUMINAIRE PROTECTION



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When electronic components form part of lighting systems, it is often necessary to protect such components against power-supply interruptions and electric overloads (power surges).

This data sheet presents electronic components to protect luminaires against mains surges and inrush current limiters.



## Luminaire Protection Device

### For electronic devices

When electronic components form part of lighting systems, it is often necessary to protect such components against power-supply interruptions and electric overloads (power surges).

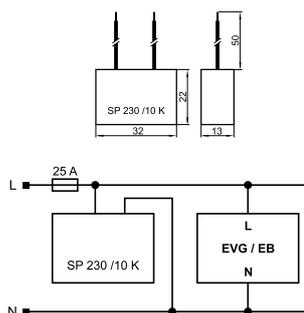
These can be caused by switching inductive loads or by atmospheric discharges such as lightning striking the mains or the ground. A further cause can be induced voltages from neighbouring cables when working with leading-edge phase-cutting controls.

The protection unit reduces over-voltages at the connection terminals of electronic components. The remaining residual voltage is then reduced to a respective protective level, based on the discharge current.

### SP 230/10 K

Suitable for luminaires of protection class II  
Type 3 product  
With integrated thermal fuse  
Dimensions (LxWxH): 32x22x13 mm  
Weight: 20 g  
Connecting: solid wire, length: 50 mm

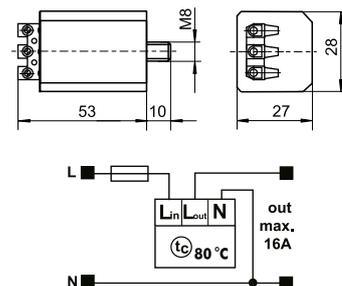
Ref. No.: 147230



### SPC 230/10 K

If the protective luminaire component overloads, the connected lighting circuit will be interrupted. This cut-out function makes it easier to detect the end of life of the protective component, facilitates quick replacement by maintenance staff and provides reliable protection for lighting components.  
Suitable for luminaires of protection class II  
Type 3 product  
Dimensions (LxWxH): 53x28x27 mm  
Weight: 50 g  
Screw terminals: 0.5–1.5 mm<sup>2</sup>

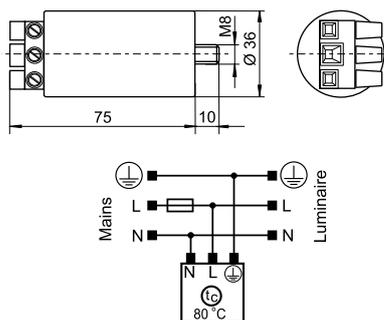
Ref. No.: 142736



### SP 3/230/10 K

Suitable for luminaires of protection class I  
Type 3 product  
Dimensions (ØxH): Ø 36x75 mm  
Weight: 60 g  
Screw terminals: 0.75–4 mm<sup>2</sup>

Ref. No.: 147233



Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Max. impulse voltage U <sub>OC</sub> (V)	Discharge current* (8/20 µs) I <sub>N</sub> (A)   I <sub>max.</sub> (A)		Protection level at discharge current of 1000 A	Safety max. A	Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
SP 230/10 K	147230	220–240	—	10000	5000	10000	≤ 850 V	25	80	–30	—
SPC 230/10 K	142736	220–240	16	10000	5000	10000	≤ 850 V	16	80	–30	M8x10
SP 3/230/10 K	147233	100–277	—	10000	5000	10000	≤ 1000 V	25	80	–30	M8x10

\* Discharge current: at 5000 A min. 15 strikes; at 10,000 A min. 1 strike

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

## Luminaire Protection Device – Type 3

### For electronic devices

These protective components are fitted with an LED indicator. Once the end of the component's life has been reached, the green LED goes out and the protective component has to be replaced.

### SP230/10 K/HS/i

The green LED light will go out if the protective function fails

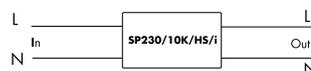
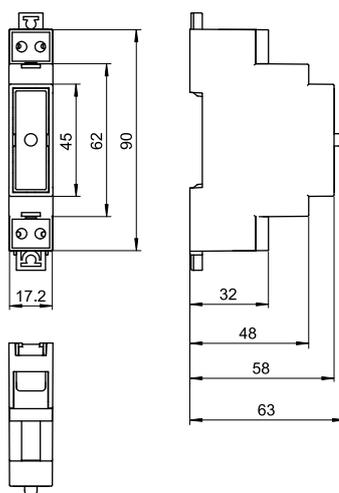
Dimensions (LxWxH): 90x17.2x63 mm

Weight: 45 g

Screw terminals: 0.5–2.5 mm<sup>2</sup>

Fixation on DIN installation rail

**Ref. No.:147240**



Type	Ref. No.	Voltage 50/60 Hz V ±10 %	Max. load current (A)	Protection level at discharge current of 1000 A	Max. impulse voltage U <sub>OC</sub> (V)	Discharge current* (8/20 μs)		Safety	Max. permitted casing temperature °C	Fixation
						I <sub>N</sub> (A)	I <sub>max</sub> (A)	max. A		
SP230/10 K/HS/i	<b>147240</b>	220–240	16	≤ 1000 V	10000	5000	10000	16	–35 to 80	DIN-rail

\* Discharge current: at 5000 A min. 15 strikes; at 10,000 A min. 1 strike

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## Luminaire Protection Device – Type 3

### For electronic devices

These protective components are fitted with internal thermal fuses. The protective component will be disconnect from the mains at the end of the internal varistors' life or if there is a permanently overvoltage.

In that case the green LED goes out and the protective component has to be replaced.

AC-system: TT-TN-IT

Temporary overvoltage

(TOV)-LV: 443 V AC (5 sec.) / 443 V (120 min.)

(TOV)-MV/HV: 1200 V AC (200 msec.)

$I_{scrr}$ : 1000 A

With integrated thermal fuse

Dimensions (LxWxH): 79x45x35 mm

### SP3/230/10K/i

Suitable for luminaires of protection class I

Push-in terminals: 0.5–2.5 mm<sup>2</sup>

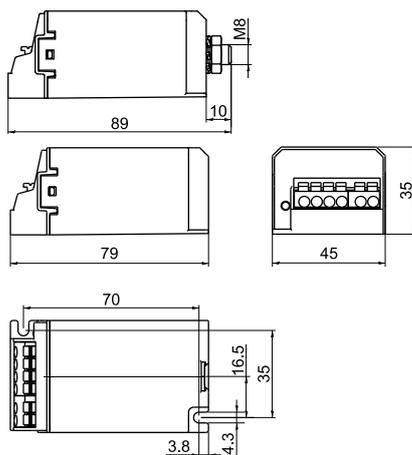
Degree of protection: IP20

DEKRA approved acc. to EN 61643-11

Weight: 67/72 g

**Ref. No.: 142743** without fixing threaded bolt

**Ref. No.: 142744** with fixing threaded bolt



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### SPC3/230/20K/i

Suitable for luminaires of protection class I

Push-in terminals: 0.75–2.5 mm<sup>2</sup>

Degree of protection: IP20

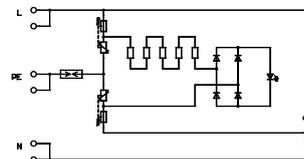
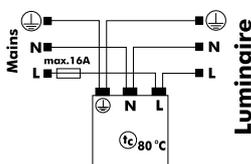
Comply with the requirements of EN 61643-11

Weight: 55/60 g

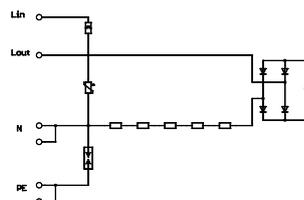
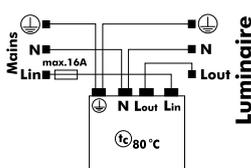
**Ref. No.: 142752** without fixing threaded bolt

**Ref. No.: 142751** with fixing threaded bolt

SP3 230/10K/i



SPC3/230/10K/i



Type	Ref. No.	Voltage 50/60 Hz V ±10 %	Max. load current (A)	Protection level			Ipe μA	Max. impulse voltage Uoc (V)	Discharge current* (8/20 μs)		Safety max. A	Max. permitted casing temp. °C	Fixing threaded bolt
				L-N (V)	L-PE (V)	N-PE (V)			IN (A)	I <sub>max</sub> (A)			
SP3/230/10K/i	142743	100–277	16	< 1500	< 1800	< 1800	1	10000	5000	10000	16	–35 to 80	without
SP3/230/10K/i	142744	100–277	16	< 1500	< 1800	< 1800	1	10000	5000	10000	16	–35 to 80	with
SPC3/230/20K/i	142751	100–277	16	< 1500	< 2200	–	1	20000	10000	20000	16	–35 to 80	with
SPC3/230/20K/i	142752	100–277	16	< 1500	< 2200	–	1	20000	10000	20000	16	–35 to 80	without

\* Discharge current: at I<sub>N</sub> min. 15 strikes; at I<sub>max</sub>. 1 strike

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# One-phase Luminaire Protection Devices – Type 3 with Protection of Control Phase or DALI Interface

## For electronic devices

These protective components are fitted with internal thermal fuses. The protective component will be disconnect from the mains at the end of the internal varistors' life or if there is a permanently overvoltage.  
In that case the green LED goes out and the protective component has to be replaced.

Suitable for luminaires of protection class I  
Dimensions (LxWxH): 79x45x35 mm  
Fixing threaded bolt on request  
Push-in terminals: 0.2–2.5 mm<sup>2</sup>  
Permitted casing temperature: –35 to 80 °C  
With integrated thermal fuse  
Fuse: max. 16 A  
Max. residual current (I<sub>PE</sub>): 1 µA  
Degree of protection: IP20

AC-system: TT-TN-IT  
Temporary overvoltage  
• (TOV)-LV: 443 V AC (5 sec.) / 443 V (120 min.)  
• (TOV)-MV/HV: 1200 V AC (200 msec.)  
I<sub>scrr</sub>: 1000 A

### SPC3/230/10K/i LS

One-phase overvoltage protection for control phase  
Comply with the requirements of EN 61643-11  
Weight: 69/79 g

Ref. No.: 142755

### SPC3/230/10K/i LS DI

With integrated coordination circuit

Ref. No.: 142756

### SPC3/230/10K/i DALI

One-phase overvoltage protection for L, N, PE and for protection of DALI signal  
Comply with the requirements of EN 61643-11 and EN 61643-21

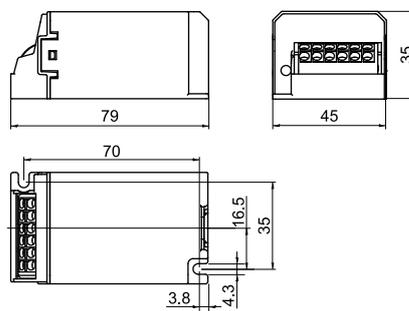
Weight: 57/67 g

Ref. No.: 142753

### SPC3/230/10K/i DALI DI

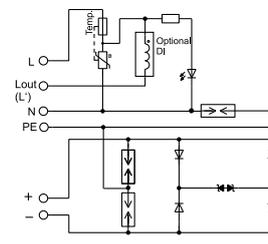
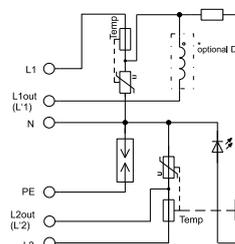
With integrated coordination circuit

Ref. No.: 142754



SPC3/230/10K/i LS

SPC3/230/10K/i DALI DI



Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Protection level			Max. impulse voltage U <sub>OC</sub> (V)	Discharge current* (8/20 µs)		Protection voltage DALI		Capacity d+ to d- pF
				L-N (V)	L-PE (V)	L2-N (V)		I <sub>N</sub> (A)	I <sub>max</sub> (A)	d+ to d- Channel 1	d1/d2 to PE Channel 2	
SPC3/230/10K/i LS	142755	100–277	5	< 1500	< 1900	< 1600	10000	5000	10000	–	–	–
SPC3/230/10K/i LS DI	142756	100–277	2.5	< 1500	< 1900	< 1600	10000	5000	10000	–	–	–
SPC3/230/10K/i DALI	142753	100–277	5	< 1500	< 1900	–	10000	5000	10000	< 70	< 1000	< 20
SPC3/230/10K/i DALI DI	142754	100–277	2.5	< 1500	< 1900	–	10000	5000	10000	< 70	< 1000	< 20

\* Discharge current: at I<sub>N</sub> min. 15 strikes; at I<sub>max</sub>. 1 strike

## Integrated Coordination Circuit

In contrast to standard protective components, the SPC3...DI components feature an integrated coordination circuit. Coordination means that the highest share of the energy applied to luminaires in the form of high-voltage pulses is discharged, which in turn ensures the protective components within the LED driver are subjected to only minimal voltage loads. This coordination can be checked by carrying out a high-voltage test on the luminaires. A decoupling inductor is also available as a separate product, which must be wired in between the protective component and the LED driver.

Type: DI-5A

Ref. No.: 149830



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# Luminaire Protection Device – Type 2 and 3

## For electronic devices

These protective components are fitted with an LED indicator. Once the end of the component's life has been reached, the green LED goes out and the protective component has to be replaced. If the protective luminaire component overloads, the connected lighting circuit will be interrupted.

This cut-out function makes it easier to detect the end of life of the protective component, facilitates quick replacement by maintenance staff and provides reliable protection for lighting components.  
 Dimensions (LxWxH): 76x34x27 mm  
 Weight: 100 g, with integrated thermal fuse  
 DEKRA approved acc. to EN 61643-11

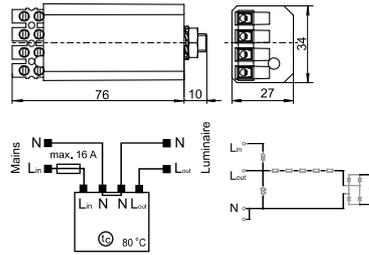
AC system: TT-TN-IT  
 Temporary overvoltage  
 • (TOV)-LV: 443 V AC (5 sec.) / 443 V (120 min.)  
 • (TOV)-MV/HV: 1200 V AC (200 msec.)  
 $I_{scrr}$ : 4500 A



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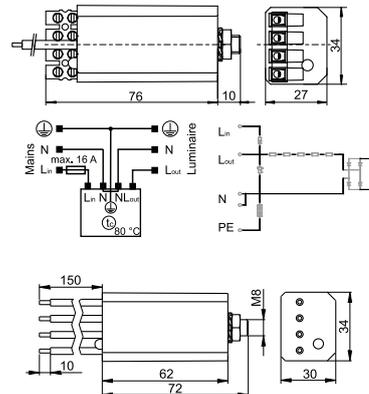
### SPC 230/10 K/i

Suitable for luminaires of protection class II  
 Screw terminals: 0.75–2.5 mm<sup>2</sup>  
 Degree of protection: IP20  
**Ref. No.: 142737**



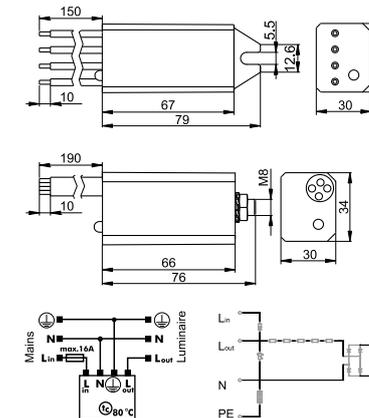
### SPC 3/230/10 K/i

Suitable for luminaires of protection class I  
 Screw terminals: 0.75–2.5 mm<sup>2</sup>  
 Lead ground terminal: stranded conductors, 2.5 mm<sup>2</sup>,  
 silicone insulation, length: 150 mm  
 Degree of protection: IP20  
**Ref. No.: 142738**  
**Ref. No.: 142742**  
 Earthing wire with M4 ring-tongue  
**Ref. No.: 142746**



### SPC 3/230/10 K/i-IP66

4 leads: stranded conductors, 2.5 mm<sup>2</sup>,  
 silicone insulation, length: 150 mm  
 Degree of protection: IP66  
**Ref. No.: 142748**  
**Ref. No.: 142746** casing with fixing lug (no KEMA approval)  
**Ref. No.: 142747** with isolated cable with outer diameter approx. 12 mm (no KEMA approval)



Type	Ref. No.	Voltage 50/60 Hz V ±10 %	Max. load current (A)	Protection level		Ipe μA	Max. impulse voltage Uoc (V)	Discharge current* (8/20 μs)		Safety max. A	Max. permitted casing temp. °C	Fixation
				L-N (V)	L-PE (V)			IN (A)	I <sub>max</sub> (A)			
SPC 230/10 K/i	<b>142737</b>	100–277	16	< 1500	–	–	10000	5000	10000	16	–35 to 80	M8x10
SPC 3/230/10 K/i	<b>142738</b>	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–35 to 80	M8x10
SPC 3/230/10 K/i	<b>142742</b>	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–35 to 80	M8x10
SPC 3/230/10 K/i-IP66	<b>142748</b>	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–35 to 80	M8x10
SPC 3/230/10 K/i-IP66	<b>142746</b>	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–35 to 80	lug
SPC 3/230/10 K/i-IP66	<b>142747</b>	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–35 to 80	M8x10

\* Discharge current: at 5000 A min. 15 strikes; at 10,000 A min. 1 strike

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## Luminaire Protection Device

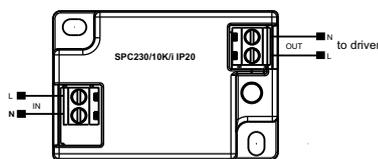
### For electronic devices

These protective components are fitted with internal thermal fuses. The protective component will be disconnect from the mains at the end of the internal varistors' life or if there is a permanently overvoltage.

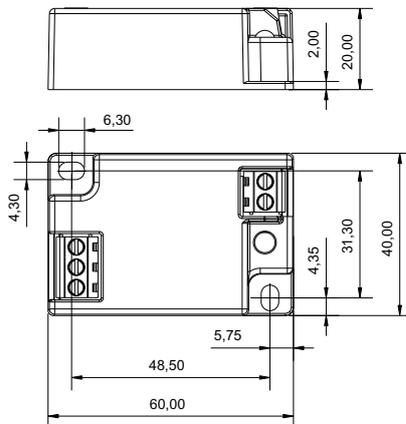
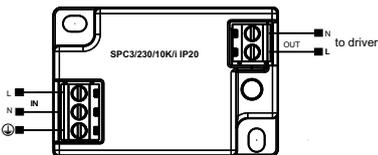
In that case the green LED goes out and the protective component has to be replaced.

Un: 100–277 V ± 10 %, 50/60 Hz  
 Max. operating voltage: 305 V AC  
 AC-system: TT-TN-IT  
 Temporary overvoltage  
 (TOV)-LV: 403 V AC (5 sec.) / 528 V (120 min.)  
 (TOV)-MV/HV: 1200 V AC (200 msec.)  
 $I_{scr}$ : 300 A  
 With integrated thermal fuse  
 Dimensions (LxWxH): 60x40x20 mm  
 Protection class: IP20

### SPC230/10K/i-IP20



### SPC3/230/10K/i-IP20



Packaging unit: 81 pieces



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Type	Ref. No.	SPD Type according to EN 61643-11	Connection terminal	Max. load current (A)	Protection level		Max. impulse voltage U <sub>OC</sub> (V)	Discharge current* (8/20 μs) I <sub>N</sub> (A)	Suitable for luminaire protection class
					L-N (V)	L-PE (V)			
SPC3/230/10K/i-IP20	<b>142721</b>	T3	Screw (1.0–2.5 mm <sup>2</sup> )	3.5	< 1500	< 1800	< 12000	5000	I
SPC3/230/10K/i-IP20	<b>142711</b>	T3	Push-in (0.2–1.5 mm <sup>2</sup> )	3.5	< 1500	< 1800	< 12000	5000	I
SPC3/230/12K/i-IP20	<b>142702</b>	T3	Push-in (0.2–1.5 mm <sup>2</sup> )	3.5	< 1500	< 1800	< 12000	5000	I
SPC3/230/10K/i-IP20	<b>142775</b>	T2 + T3	Push-in (0.2–1.5 mm <sup>2</sup> )	3.5	< 1500	< 1800	< 12000	5000	I
SPC3/230/10K/i-IP20	<b>143777</b>	T2 + T3	Screw (1.0–2.5 mm <sup>2</sup> )	3.5	< 1500	< 1800	< 12000	5000	I
SPC230/10K/i-IP20	<b>142722</b>	T2 + T3	Screw (1.0–2.5 mm <sup>2</sup> )	3.5	< 1500	-	< 12000	5000	II
SPC230/10K/i-IP20	<b>142710</b>	T2 + T3	Push-in (0.2–1.5 mm <sup>2</sup> )	3.5	< 1500	-	< 12000	5000	II
SPC/230/12K/i-IP20	<b>142701</b>	T2 + T3	Push-in (0.2–1.5 mm <sup>2</sup> )	3.5	< 1500	-	< 12000	5000	II

\* Discharge current: at I<sub>N min.</sub> 15 strikes

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# Inrush Current Limiter ESB

## Limits capacitive inrush currents of electronic ballasts and LED drivers and converters

Due to their capacitive nature, electronic operating devices generate high inrush currents. By temporarily activating a limiting resistor, the inrush current is reduced to an uncritical value (see graph below).

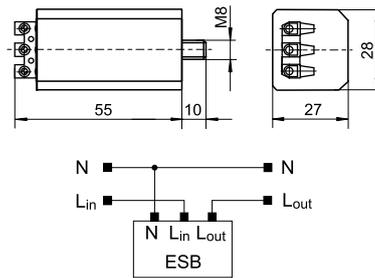
Several electronic devices can be connected downstream under consideration of the maximum permissible continuous current of the inrush current limiter. As a result, the load per circuit breaker (MCB) can be increased by at least 2.5 fold.

The ESB thus prevents any automatic circuit breakers from being triggered or any damage from being caused to upstream relay contacts. Switching cycles: > 10,000

### ESB-6K

Casing: PC  
 Dimensions (LxWxH): 55x28x27 mm  
 Weight: 61 g  
 Screw terminals: 0.5–1.5 mm<sup>2</sup>  
 AC-Types VDE approved

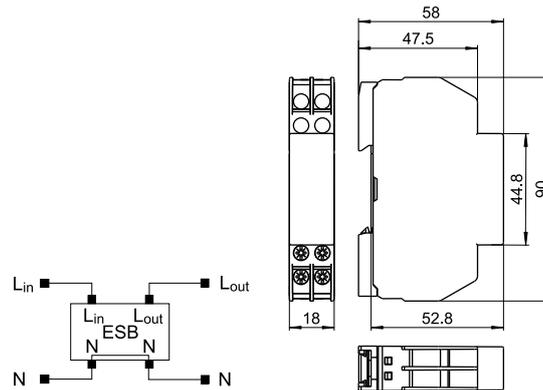
Ref. No.: 149820  
 Ref. No.: 149822  
 Ref. No.: 149823



### ESB-16HS

Casing: PC  
 Dimensions (LxWxH): 90x18x58 mm  
 Weight: 75 g  
 Screw terminals: 0.5–2.5 mm<sup>2</sup>

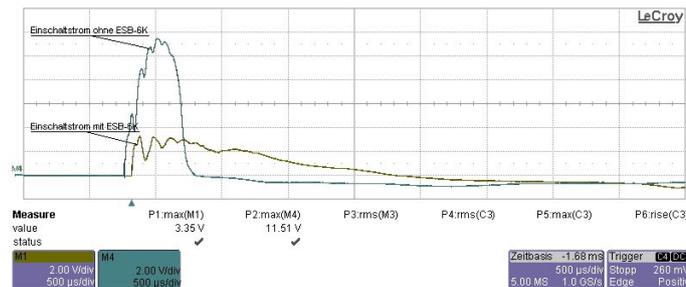
Ref. No.: 149821



Type	Ref. No.	Nominal voltage		Power consumption W	Max. direct current A	Limiting resistor Ω	Period of limitation		Max. permitted casing temperature (°C)	Min. permitted ambient temperature (°C)	Fixation
		50–60 Hz V ± 10.0%	DC V ± 10.0%				ms	ms			
ESB-6K	149820	220–240	–	0.25	6	20	approx. 18	–	80	–30	M8x10
ESB-16HS	149821	220–240	–	0.6	16	11.2	approx. 18	–	80	–30	DIN-rail
ESB-6K_1A	149822	220–240	–	0.25	6	440	approx. 160	–	80	–30	M8x10
ESB-6K-DC	149823	220–240	225–250	0,25	6	20	approx. 18	approx. 30	80	–30	M8x10

### Example using a 150 W LED driver

Brown: with ICL (ESB)  
 Blue: without ICL (ESB)  
 1 V = 1 A



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