

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

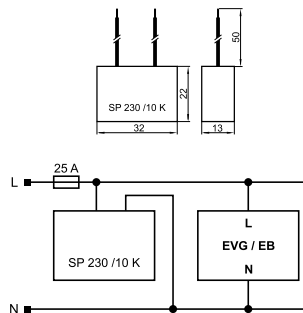
With integrated thermal fuse

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

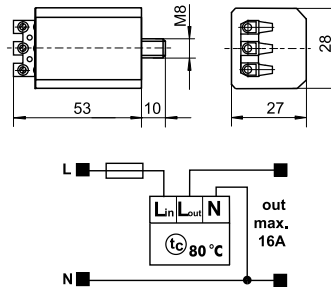
Type 3 product

Dimensions (LxWxH): 53x28x27 mm

Weight: 50 g

Screw terminals: 0.5–1.5 mm²

Ref. No.: 142736



SP 3/230/10 K-IP66 and SPC3/230/10 K-IP66

Suitable for luminaires of protection class I

Type 3 product

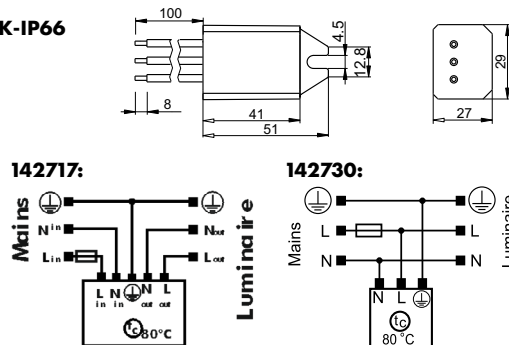
Dimensions (LxWxH): 41x29x27 mm

Weight: 60 g

1.5mm² Stranded wires 80-100mm

Serial version Ref. No.: 142717

Parallel version Ref. No.: 142730



Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 μs) I _N (A) I _{max} (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	–40	—
SPC 230/10 K	142736	220–240	16	10000	5000 10000	≤ 850 V	16	80	–40	M8x10
SP 3/230/10 K-IP66	142730	100–277	—	10000	5000 10000	≤ 1000 V	25	80	–40	Lug
SPC3/230/10 K-IP66	142717	100–277	5	10000	5000 10000	≤ 1000 V	25	80	–40	Lug

* 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

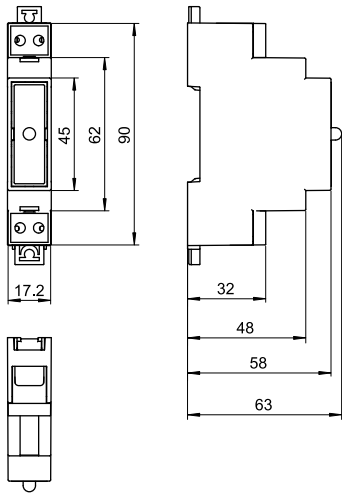
Dimensions (LxWxH): 90x17.2x63 mm

Weight: 45 g

Screw terminals: 0.5–2.5 mm²

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 _{OC} (V)	Discharge current* (8/20 µs)		Safety	Max. permitted casing temperature °C	Fixation
SP230/10 K/HS/i	147240	220–240	16	≤ 1000 V	10000	I _N (A)	I _{max} (A)	max. A	–35 to 80	DIN-rail

* 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 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 mm²

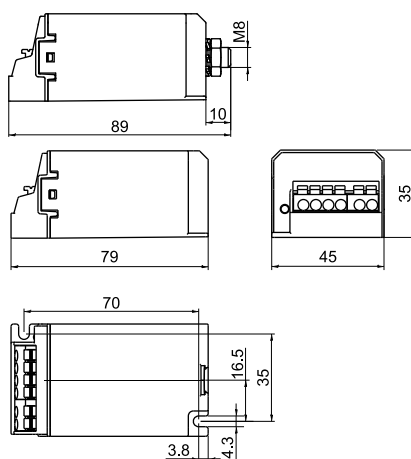
Degree of protection: IP20

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



SPC3/230/20K/i

Suitable for luminaires of protection class I

Push-in terminals: 0.75–2.5 mm²

Degree of protection: IP20

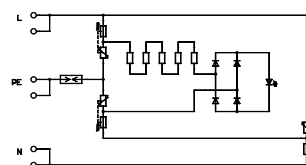
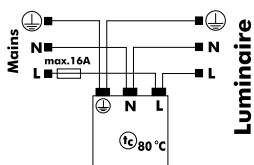
Comply with the requirements of EN 61643-11

Weight: 55/60 g

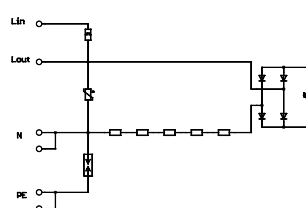
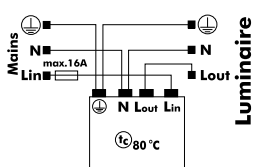
Ref. No.: 142752 without fixing threaded bolt

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 _{max} (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 $I_{N \min}$ 15 strikes; at $I_{N \max}$ 1 strike

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Luminaire Protection Device – Type 2 and 3

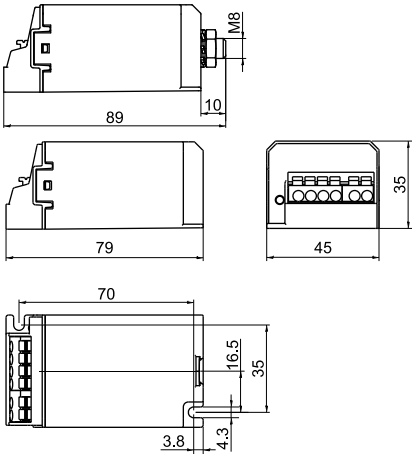
For electronic devices

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.

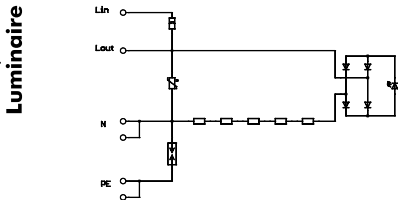
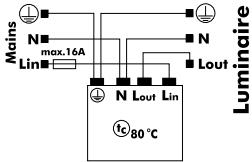
AC-system: TN
Temporary overvoltage
(TOV)-LV: 403 V AC (5 sec.) / 403 V (120 min.)
(TOV)-MV/HV: 528 V AC (200 msec.)
I_{scrr}: 100 A
With integrated thermal fuse
Dimensions (LxWxH): 79x45x35 mm

SPC3/230/20K/i

Suitable for luminaires of protection class I
Push-in terminals: 0.75–2.5 mm²
Degree of protection: IP20
DEKRA approved acc. to EN 61643-11
Weight: 60 g
Ref. No.: 142729 with fixing threaded bolt



SPC3/230/10K/i



Type	Ref. No.	Voltage 50/60 Hz V ±10 %	Max. load current (A)	Protection level L-N (V) L-PE (V)	I _{pe} μA	Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 μs) I _N (A)	Safety max. A	Max. permitted casing temp. °C	Fixing threaded bolt
SPC3/230/20K/i	142729	100–277	5	< 1500 < 2200	1	20000	10000	20	–35 to 80	with

* Discharge current: at I_N min. 15 strikes; at I_{max}. 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.

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

Suitable for luminaires of protection class I

Dimensions (LxWxH): 79x45x35 mm

Fixing threaded bolt on request

Push-in terminals: 0.2–2.5 mm²

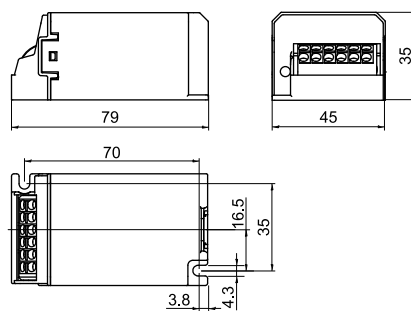
Permitted casing temperature: –35 to 80 °C

With integrated thermal fuse

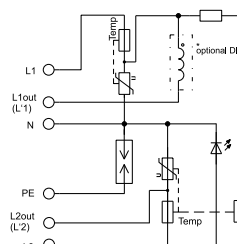
Fuse: max. 16 A

Max. residual current (I_{PE}): 1 µA

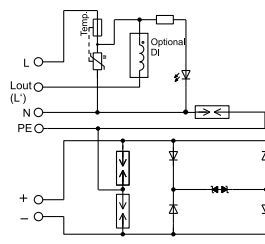
Degree of protection: IP20



SPC3/230/10K/i LS



SPC3/230/10K/i DALI DI



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



Type	Ref. No.	Voltage 50/60 Hz V ± 10 %	Max. load current A	Protection level			Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 µs)		Protection voltage DALI		
				L-N (V)	L-PE (V)	L2-N (V)		I _N (A)	I _{max} (A)	d+ to d- Channel 1 0,5 kV/0,25 kA	d1/d2 to PE Channel 2 10 kV/5 kA	Capacity d+ to d- pF
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_N min. 15 strikes; at I_{max} 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_{scr}: 4500 A



SPC 230/10 K/i

Suitable for luminaires of protection class II

Screw terminals: 0.75–2.5 mm²

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 mm²

Lead ground terminal: stranded conductors, 2.5 mm²,
silicone insulation, length: 150 mm

Degree of protection: IP20

Ref. No.: 142738

Earthing wire with M4 ring-tongue

Ref. No.: 142742

SPC 3/230/10 K/i-IP66

4 leads: stranded conductors, 2.5 mm²,

silicone insulation, length: 150 mm

Degree of protection: IP66

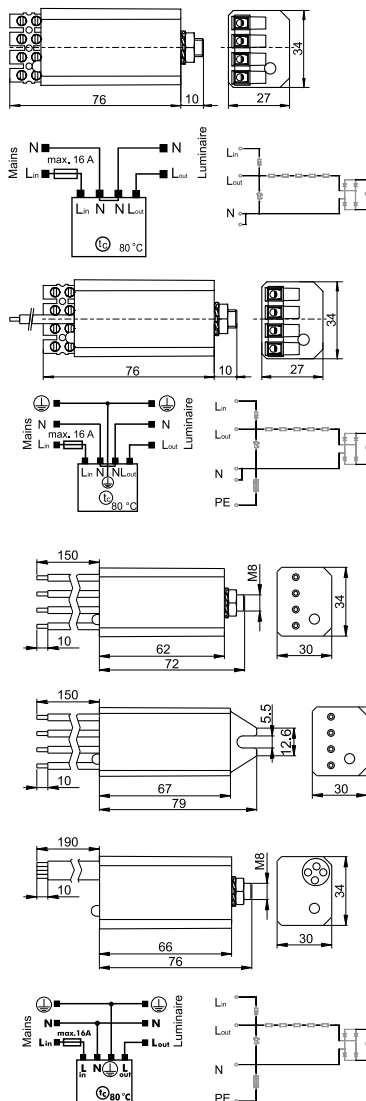
Ref. No.: 142748

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)



142737 / 142738, 142742



142748, 142746



142747

Type	Ref. No.	Voltage 50/60 Hz V ±10 %	Max. load current (A)	Protection level		Ipe μA	Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 μs)		Safety max. A	Max. permitted casing temp. °C	Fixation
				L-N (V)	L-PE (V)			I _N (A)	I _{max} (A)			
SPC 230/10 K/i	142737	100–277	16	< 1500	–	–	10000	5000	10000	16	–40 to 80	M8x10
SPC 3/230/10 K/i	142738	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–40 to 80	M8x10
SPC 3/230/10 K/i	142742	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–40 to 80	M8x10
SPC 3/230/10 K/i-IP66	142748	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–40 to 80	M8x10
SPC 3/230/10 K/i-IP66	142746	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–40 to 80	lug
SPC 3/230/10 K/i-IP66	142747	100–277	16	< 1500	< 1800	1	10000	5000	10000	16	–40 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.)

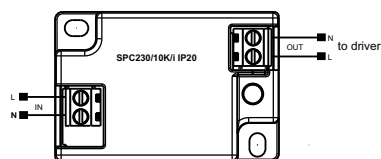
I_{scer}: 300 A

With integrated thermal fuse

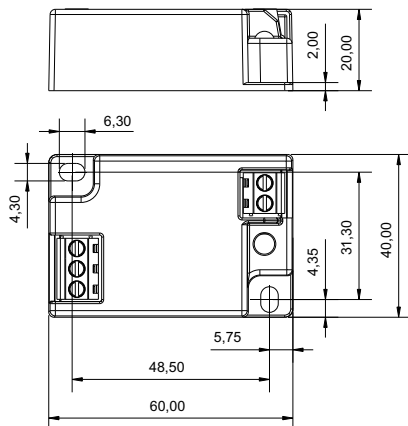
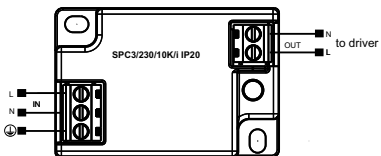
Dimensions (LxWxH): 60x40x20 mm

Protection class: IP20

SPC230/10K/i-IP20



SPC3/230/10K/i-IP20



142721, 142722, 143777



142710, 142711, 142775



142701, 142702

Packaging unit: 81 pieces



Type	Ref. No.	SPD Type according to EN 61643-11	Connection terminal	Max. load current (A)	Protection level		Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 μs) I _N (A)	Suitable for luminaire protection class
					L-N (V)	L-PE (V)			
SPC3/230/10K/i-IP20	142721	T3	Screw (1.0–2.5 mm ²)	5	< 1500	< 1800	12000	5000	I
SPC3/230/10K/i-IP20	142711	T3	Push-in (0.2–1.5 mm ²)	5	< 1500	< 1800	12000	5000	I
SPC3/230/12K/i-IP20	142702	T3	Push-in (0.2–1.5 mm ²)	5	< 1500	< 1800	12000	5000	I
SPC3/230/10K/i-IP20	142775	T2 + T3	Push-in (0.2–1.5 mm ²)	5	< 1500	< 1800	12000	5000	I
SPC3/230/10K/i-IP20	143777	T2 + T3	Screw (1.0–2.5 mm ²)	5	< 1500	< 1800	12000	5000	I
SPC230/10K/i-IP20	142722	T2 + T3	Screw (1.0–2.5 mm ²)	5	< 1500	-	12000	5000	II
SPC230/10K/i-IP20	142710	T2 + T3	Push-in (0.2–1.5 mm ²)	5	< 1500	-	12000	5000	II
SPC/230/12K/i-IP20	142701	T2 + T3	Push-in (0.2–1.5 mm ²)	5	< 1500	-	12000	5000	II

* Discharge current: at I_N min. 15 strikes

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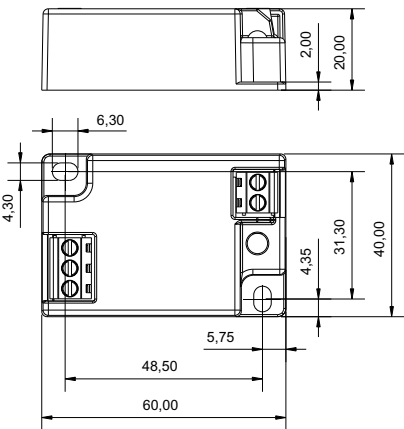
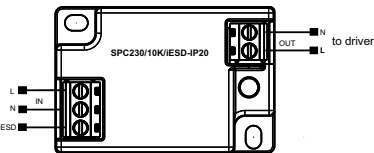
Luminaire Protection Device for protection class II to avoid ESD

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_{scrr}: 300 A
With integrated thermal fuse
Dimensions (LxWxH): 60x40x20 mm
Protection class: IP20

SPC230/10K/iESD-IP20



By connecting the luminaire enclosure or chasis to the ESD-port of the SPD, these SCII fixtures will protect against ElectroStatic Discharge.

Packaging unit: 81 pieces

Type	Ref. No.	SPD Type according to EN 61643-11 and EN 60598	Connection terminal	Max. load current (A)	Protection level		Max. impulse voltage U _{OC} (V)	Discharge current* (8/20 μs) I _N (A)	Suitable for luminaire protection class
					L-N (V)	L-PE (V)			
SPC230/10K/iESD-IP20	142777	T2 + T3	Push-in (0.2–1.5 mm²)	5	< 1500	-	12000	5000	II

* Discharge current: at I_N min. 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

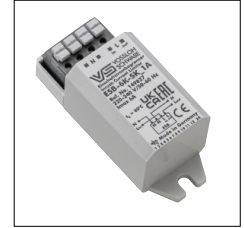
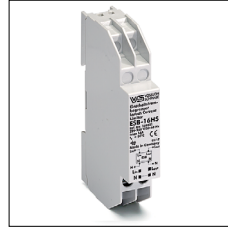
Weight: 61 g

Screw terminals: 0.5–1.5 mm²

AC-Types VDE approved

Ref. No.: 149820, 149822

149823



ESB-6K-SK

Casing: PC

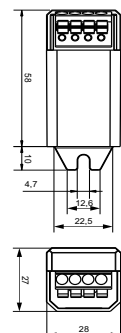
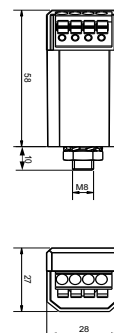
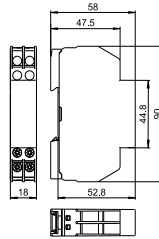
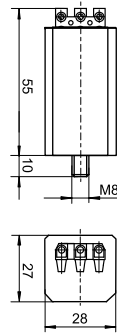
Dimensions (LxWxH): 58x28x27 mm

Weight: 63 g

Push-in terminals: 0.25–2.5 mm², for solid & fine stranded conductor

Ref. No.: 149825, 149826

149827, 149828



ESB-16HS

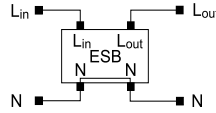
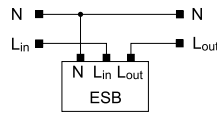
Casing: PC

Dimensions (LxWxH): 90x18x58 mm

Weight: 75 g

Screw terminals: 0.5–2.5 mm²

Ref. No.: 149821



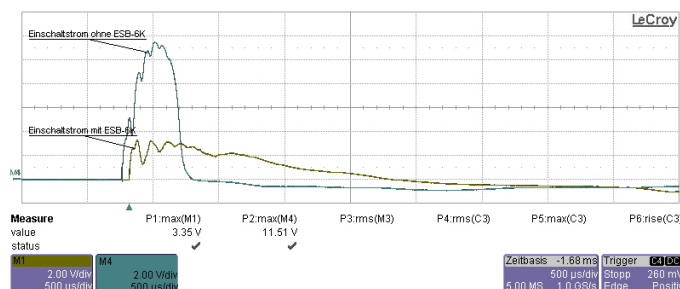
Type	Ref. No.	Nominal voltage		Power	Max.	Limiting	Period of limitation		Max. permitted	Min. permitted	Fixation
		50–60 Hz	DC	consumption	direct current	resistor			casing	ambient	
		V ± 10 %	V ± 10 %	W	A	Ω	ms	ms	temperature (°C)	temperature (°C)	
ESB-6K	149820	220–240	–	0.25	6	20	approx. 18	–	80	–30	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
ESB-6K-SK-DC	149825	220–240	225-250	0.25	6	20	approx. 18	approx. 30	80	–30	M8x10
ESB-6K-SK	149826	220–240	–	0.25	6	20	approx. 18	–	80	–30	M8x10
ESB-6K-SK-1A	149827	220–240	–	0.25	6	440	approx. 20	–	80	–30	M8x10
ESB-6K-SK-DC	149828	220–240	225-250	0.25	6	20	approx. 18	approx. 30	80	–30	Lug

Example using a 150 W LED driver

Brown: with ICL (ESB)

Blue: without ICL (ESB)

1 V = 1 A



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