

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE

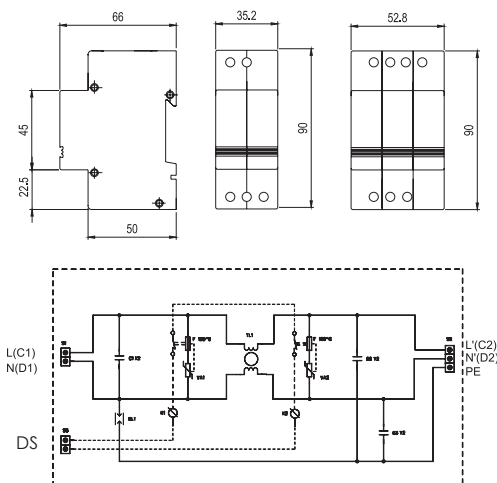


PI-k8

PI-k8 DS

PI-k8 is a single-phase surge arrester type 3, which is equipped with high-frequency filter, according to EN 61643-11 and IEC 61643-1. It is intended for use in the power supply lines, which are operated as TN-S system. The arrester PI-k8 is constructed for mounting on DIN rail 35mm and designed for protection of single-phase electronic appliances in L.V. power supply systems against the transient surge and high-frequency disturbance. The type PI-k8 is fitted with a light indicator signalling the right function (green LED diode), type PI-k8 DS indicates the failure by target disconnection of mechanical thermal fuse.

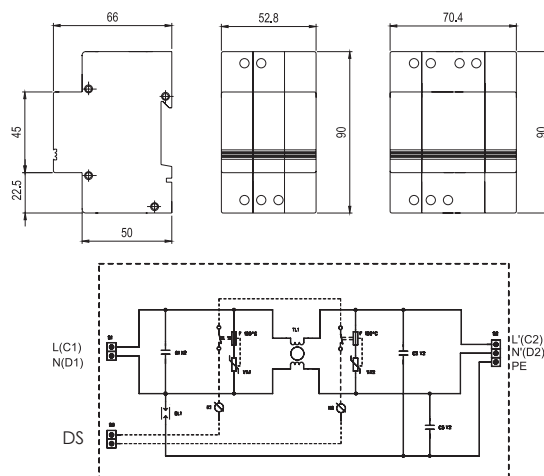
They can be manufactured in a comprehensive range of the Nominal voltages $U_N = 6, 12, 24, 48, 60, 80, 110, 120, 130, 160$ and $230V$ (AC/DC).



Type		PI-k8, PI-k8 DS
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III
Nominal voltage	U_N	230 V AC
Max. continuous operating voltage	U_C	275 V AC
Rated load current	I_L	8 A
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE) < 850 V (L/N)
Voltage protection level at U_{OC}	U_p	< 1,5 kV (L/PE) < 1,2 kV (N/PE)
Asymmetrical attenuation of filter (band-stop filter)		min. 80 dB at 4 MHz min. 40 dB (0,15 - 30 MHz)
Filters constants	C_x C_y L	150 nF 22 nF 1,2 mH
Power loss at winding temp. 20°C		< 2,2 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)
Back-up fuse		8 A
LPZ		2-3
Housing material		Polyamid PA6, UL94 V-0
Protection type		IP20
Operating temperature range	ϑ	-40°C ... +55 °C
Cross-section of the connected conductors		2,5 mm ² Cu
Mounting on		DIN rail 35 mm
Failure signalisation PI-k8		light on - ok / light off - failure
Failure signalisation PI-k8 DS		pushed in - ok / pushed out - failure
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A
Lifetime		min. 100.000 h
Weight	m	130 g, 170 g
Article number		
PI-k8		30 080
PI-k8 DS		30 082

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-k16, PI-k25, PI-k32 PI-k16 DS, PI-k25 DS

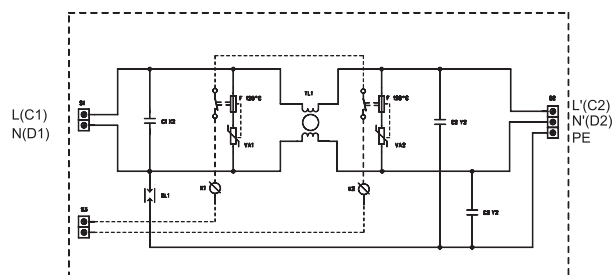
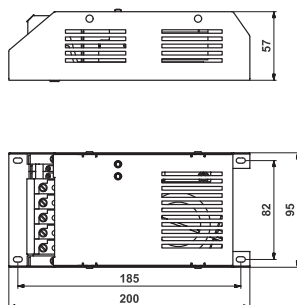
PI-k16, PI-k25 and PI-k32 are the single-phase surge arresters type 3, which are equipped with high-frequency filters, according to EN 61643-11 and IEC 61643-1. They are intended for use in the power supply lines, which are operated as TN-S system. The arresters PI-k8, PI-k25 and PI-k32 are constructed for mounting on DIN rail 35mm and designed for protection of single-phase electronic appliances in L.V. power supply systems against the transient surge and high-frequency disturbance. The types PI-k8, PI-k25 and PI-k32 are fitted with light indicator signalling the right function (green LED diode), types PI-k16 DS, PI-k25 DS and PI-k32 DS indicate the failure by target disconnection of mechanical thermal fuses.

They can be manufactured in a comprehensive range of the Nominal voltages $U_N = 6, 12, 24, 48, 60, 80, 110, 120, 130, 160$ and $230V$ (AC/DC).

Type		PI-k16, PI-k16 DS	PI-k25, PI-k25 DS	PI-k32
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III		
Nominal voltage	U_N	230 V AC		
Max. continuous operating voltage	U_C	275 V AC		
Rated load current	I_L	16 A	25 A	32 A
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)		
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE) < 850 V (L/N) < 1,5 kV (L/PE) < 1,2 kV (N/PE)		
Voltage protection level at U_{OC}	U_P	min. 80 dB at 4 MHz min. 40 dB (0,15 - 30 MHz)		
Asymmetrical attenuation of filter (band-stop filter)		min. 80 dB at 4 MHz min. 40 dB (0,15 - 30 MHz)		
Filters constants	C_x C_y L	220 nF 22 nF 1,8 mH	220 nF 22 nF 2,3 mH	2,3 mH
Power loss at winding temp. 20°C		< 3,5 W	< 3,5 W	< 4 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)		
Back-up fuse		16 A	25 A	32 A
LPZ		2-3		
Housing material		Polyamid PA6, UL94 V-0		
Protection type		IP20		
Operating temperature range	ϑ	-40°C ... +55 °C		
Cross-section of the connected conductors		4 - 6 mm ² Cu	6 - 10 mm ² Cu	6 - 10 mm ² Cu
Mounting on		DIN rail 35 mm		
Failure signalisation PI-k*		light on - ok / light off - failure		
Failure signalisation PI-k* DS		pushed in - ok / pushed out - failure		
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A		
Lifetime		min. 100.000 h		
Weight	m	170 g, 224 g	240 g	240 g
Article number				
PI-k*		30 004	30 017	30 005
PI-k* DS		30 027	30 034	-

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-k32 DS, PI-k50

PI-k63, PI-k80

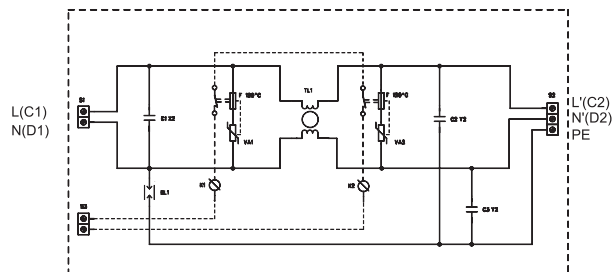
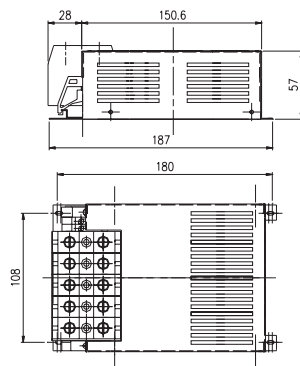
While mounting surge arresters PI-k32, 50, 63 and 80 it is necessary to ensure that the ventilation holes in their housing are not covered. These arresters are to be placed as near to the protected appliance as possible, for example near to the electronic control systems of NC machines, electronics of robotic production and another sensitive electronic appliances. It is recommended to connect the protected appliance by appropriately dimensioned and shielded conductor.

PI-k32, PI-k50, PI-k63 and PI-k80 are standardly manufactured with DS switching contact.

Type		PI-k32 DS	PI-k50	PI-k63	PI-k80
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III			
Nominal voltage	U_N	230 V AC			
Max. continuous operating voltage	U_C	275 V AC			
Rated load current	I_L	32 A	50 A	63 A	80 A
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)			
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE) < 850 V (L/N) < 1,5 kV (L/PE) < 1,2 kV (N/PE)			
Voltage protection level at U_{OC}	U_P	min. 80 dB at 4 MHz min. 40 dB (0,15 - 30 MHz)			
Asymmetrical attenuation of filter (band-stop filter)		min. 80 dB at 4 MHz min. 40 dB (0,15 - 30 MHz)			
Filters constants	C_x C_y L	M68 22 nF 2,2 mH 2,2 mH 1,4 mH			
Power loss at winding temp. 20°C		< 4 W	< 7 W	< 9 W	< 12 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)			
Back-up fuse		32 A	50 A	63 A	80 A
LPZ		2-3			
Housing material		metal plate 0,8 mm			
Protection type		IP20			
Operating temperature range	ϑ	-40°C ... +55 °C			
Cross-section of the connected conductors		25 mm ² Cu			
Mounting on		DIN rail 35 mm or by screws M4 on chassis			
Failure signalisation		pushed in - ok / pushed out - failure			
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A			
Lifetime		min. 100.000 h			
Weight	m	240	970 g	1040 g	
Article number		30 028	30 100	30 200	30 180

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-k120 PI-k150

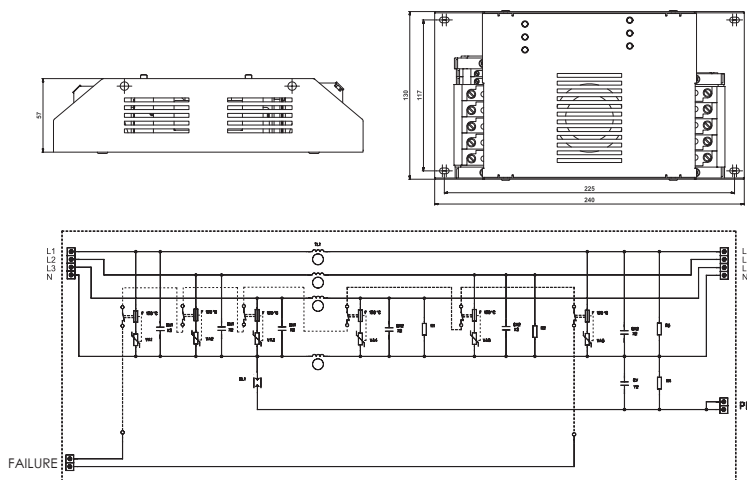
While mounting surge arresters PI-k120 and PI-k150 it is necessary to ensure that the ventilation holes in their housing are not covered. These arresters are to be placed as near to the protected appliance as possible, for example near to the electronic control systems of NC machines, electronics of robotic production and another sensitive electronic appliances. It is recommended to connect the protected appliance by appropriately dimensioned and shielded conductor.

PI-k120 and PI-k150 are standardly manufactured with DS switching contact.

Type		PI-k120	PI-k150
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III	
Nominal voltage	U_N	230 V AC	
Max. continuous operating voltage	U_C	275 V AC	
Rated load current	I_L	120 A	150 A
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)	
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE) < 850 V (L/N) < 1,5 kV (L/PE) < 1,2 kV (N/PE)	
Voltage protection level at U_{OC}	U_p	min. 80 dB at 2 MHz min. 30 dB (0,15 - 30 MHz)	
Asymmetrical attenuation of filter (band-stop filter)		min. 80 dB at 2 MHz min. 30 dB (0,15 - 30 MHz)	
Filters constants	C_x C_y L	2M 22 nF 1 mH	0,6 mH
Power loss at winding temp. 20°C		< 20 W	
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)	
Back-up fuse		120 A	150 A
LPZ		2-3	
Housing material		metal plate 0,8 mm	
Protection type		IP20	
Operating temperature range	ϑ	-40°C ... +55 °C	
Cross-section of the connected conductors		25 - 35 mm ² Cu	
Mounting on		DIN rail 35 mm or by screws M4 on chassis	
Failure signalisation		pushed in - ok / pushed out - failure	
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A	
Lifetime		min. 100.000 h	
Weight	m	1300 g	1350 g
Article number		30 220	30 230

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-3k32, PI-3k50

PI-3k63, PI-3k80

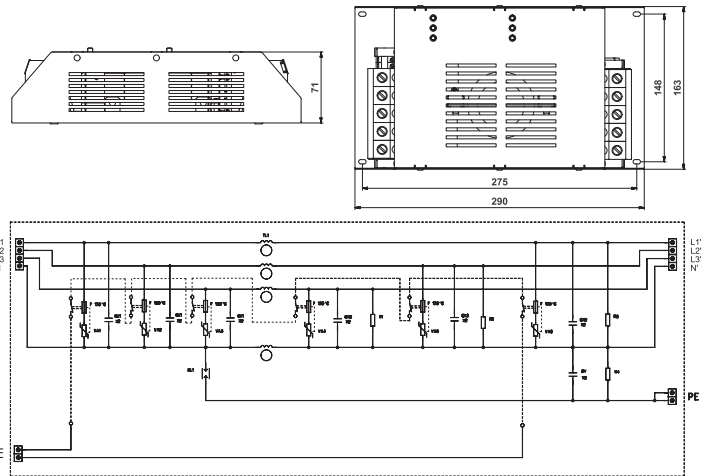
PI-3k is a three-phase surge arrester type 3, which is equipped with high-frequency filter, according to EN 61643-11 and IEC 61643-1. It is intended for use in the power supply lines, which are operated as TN-S system. PI-3k120 is designed for protection of three-phase electronic appliances in L.V. power supply systems against the transient overvoltage and high-frequency disturbance. The function failure of varistors is indicated by target disconnection of mechanical thermal fuses which react to the varistors overheating above c. 120°C.

They can be manufactured in a comprehensive range of the Nominal voltages $U_N = 6, 12, 24, 48, 60, 80, 110, 120, 130, 160$ and $230V$ (AC/DC).

Type		PI-3k32	PI-3k50	PI-3k63	PI-3k80
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III			
Nominal voltage	U _N	3 x 230 / 400 V AC			
Max. continuous operating voltage	U _C	3 x 275 / 480 V AC			
Rated load current	I _L	32 A	50 A	63A	80 A
Nominal discharge current I _n (8/20)	I _n	3 kA (L/N, L/PE) 5 kA (N/PE)			
Combined impulse	U _{OC}	6 kV (L/N,L/PE) 10 kV (N/PE)			
Voltage protection level at U _{OC}	U _P	< 850 V (L/N) < 1,5 kV (L/PE) < 1,2 kV (N/PE)			
Asymmetrical attenuation of filter (band-stop filter)		min. 80 dB at 2 MHz min. 40 dB (0,15 - 30 MHz)	min. 80 dB at 1,5 MHz min. 40 dB (0,15 - 30 MHz)	min. 80 dB at 2 MHz min. 40 dB (0,15 - 30 MHz)	min. 80 dB at 1,5 MHz min. 40 dB (0,15 - 30 MHz)
Filters constans	C _{x1}	M15			
	C _{x2}	M68			
	C _y	2 x 47 nF			
	L	2,15 mH	1 mH	2,15 mH	0,9 mH
Power loss at winding temp. 20°C		< 8 W	< 9 W	< 8 W	< 15 W
Response time	t _A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)			
Back-up fuse		32 A	50 A	63 A	80 A
LPZ		2-3			
Housing material		metal plate 0,8 mm			
Protection type		IP20			
Operating temperature range	θ	-40°C ... +55 °C			
Cross-section of the connected conductors		6 mm² Cu	10 mm² Cu	25 mm² Cu	
Mounting on		DIN rail 35 mm or by screws M4 on chassis			
Failure signalisation		pushed in - ok / pushed out - failure			
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A			
Lifetime		min. 100.000 h			
Weight	m	1500 g	1600 g		1730 g
Article number		30 301	30 305	30 303	30 302

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-3k120

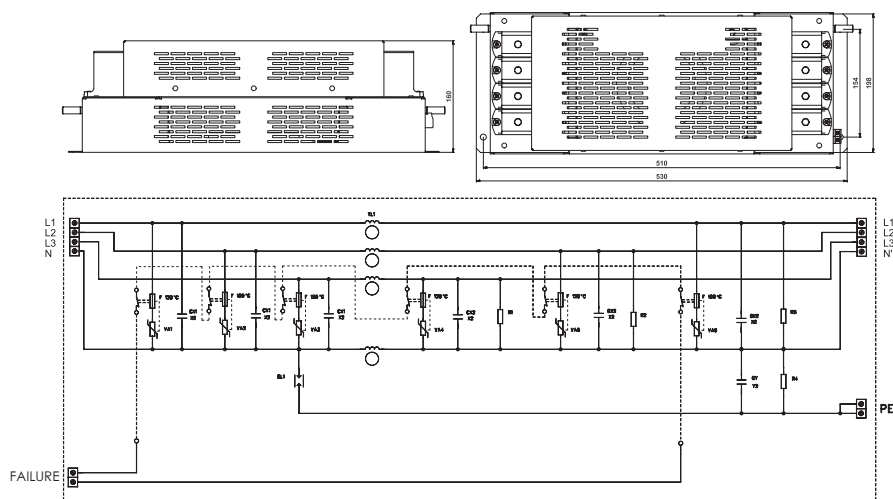
PI-3k120 is a three-phase surge arrester type 3, which is equipped with high-frequency filter, according to EN 61643-11 and IEC 61643-1. It is intended for use in the power supply lines, which are operated as TN-S system. PI-3k120 is designed for protection of three-phase electronic appliances in L.V. power supply systems against the transient overvoltage and high-frequency disturbance. The function failure of varistors is indicated by target disconnection of mechanical thermal fuses which react to the varistors overheating above c. 120°C.

They can be manufactured in a comprehensive range of the Nominal voltages $U_N = 6, 12, 24, 48, 60, 80, 110, 120, 130, 160$ and $230V$ (AC/DC).

Type		PI-3k120
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III
Nominal voltage	U_N	3 x 230 / 400 V AC
Max. continuous operating voltage	U_C	3 x 275 / 480 V AC
Rated load current	I_L	120 A
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE)
Voltage protection level at U_{OC}	U_p	< 850 V (L/N) < 1,5 kV (L/PE) < 1,2 kV (N/PE)
Asymmetrical attenuation of filter (band-stop filter)		min. 70 dB at 1,5 MHz min. 30 dB (0,15 - 30 MHz)
Filters constants	C_{x1} C_{x2} C_y L	M15 M68 2 x 47 nF 1 mH
Power loss at winding temp. 20°C		< 25 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)
Back-up fuse		120 A
LPZ		2-3
Housing material		metal plate 0,8 mm
Protection type		IP20
Operating temperature range	ϑ	-40°C ... +55 °C
Cross-section of the connected conductors		25 - 35 mm² Cu
Mounting on		DIN rail 35 mm or by screws M4 on chassis
Failure signalisation		pushed in - ok / pushed out - failure
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A
Lifetime		min. 100.000 h
Weight	m	2600 g
Article number		30 307

Surge arrester / varistor & EMC / EMI filter / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



PI-3k250

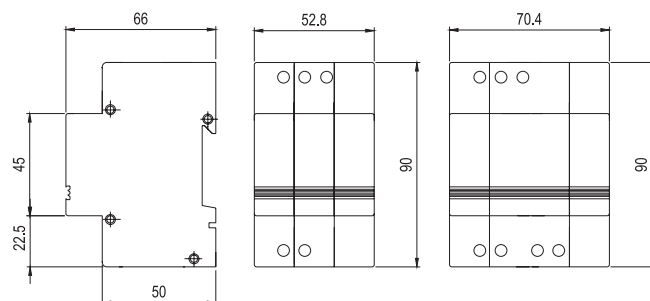
PI-3k400

PI-3k250 and PI-3k400 are the three-phase surge arresters, which are equipped with high-frequency filters, according to EN 61643-11 and IEC 61643-1. They are produced in basic version for mounting straight onto the switchboard's construction by screws M8. They are intended for protection of three-phase electronic appliances against the effects of the lightning current and switching overvoltage, which are generated in the L.V. power supply networks. The device includes a two-pole output terminal for remote monitoring, which is solved on the basis of a potential-free switching contact. This contact is enabled for opening in case of failure of any in-built protective varistors.

Type		PI-3k250	PI-3k400
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 1+2+3, CLASS I+II+III	
Nominal voltage	U_N	3 x 230 / 400 V AC	
Max. continuous operating voltage	U_C	3 x 335 / 570 V AC	
Rated load current	I_L	250 A	400 A
Combined impulse	U_{OC}	6 kV	
Nominal discharge current $I_n(8/20)$	I_n	40 kA (L/N, L/PE)	
		50 kA (N/PE)	
Max. discharge current $I_{max}(8/20)$	I_{max}	100 kA	
Lightning impulse current (10/350) L/N	I_{imp}	12,5 kA	
Lightning impulse current (10/350) N/PE	I_{imp}	50 kA	
Total lightning current (10/350) L1+L2+L3+N→PE	I_{total}	50 kA	
Voltage protection level at U_{OC}	U_P	< 1,25 kV	
Asymmetrical attenuation (band-stop filter)		min. 70 dB at 1,5 MHz	
		min. 30 dB (0,15 - 30 MHz)	
Filters constants	C_{x1}	2M2	
	C_{x2}	2M2	
	R_x	1 MΩ	
	C_y	2 x 50 nF	
	R_y	1 MΩ	
	L	1,5 mH	
Power loss at winding temp. 20°C		cca 70 W	cca 125 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)	
Back-up fuse		250 A	400 A
LPZ		0-3	
Housing material		metal plate 0,8 mm	
Protection type		IP20	
Operating temperature range	ϑ	-40°C ... +55 °C	
Cross sectional area of connected Al/Cu wires		35-120 mm ² / 26 Nm	
		150-240 mm ² / 55 Nm	
Installation method		horizontal with exposed ventilation holes by screws M8 on chassis	
Failure signalisation (F/M)		230 V AC / 0,5 A	
		Potential free release contact (NC TYPE)	
Lifetime		min. 100.000 h	
Weight	m	8 kg	10 kg
Article number		30 309	30 308

Surge arrester / varistor + gas discharge tube / TYPE 3

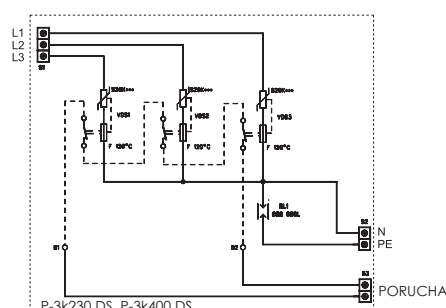
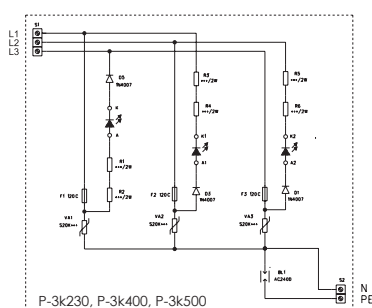
TYPE 3 / CLASS III / TN-S / TN-C / TT / CE



P-3k230, P-3k400, P-3k500 P-3k230 DS, P-3k400 DS

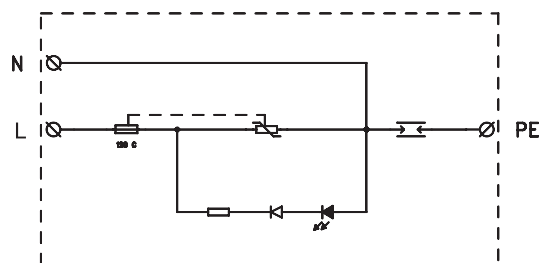
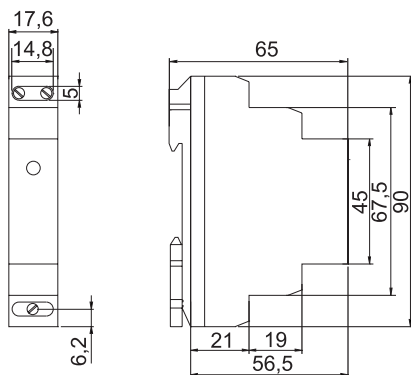
P-3k are the three-phase surge arresters type 3 according to EN 61643-11 and IEC 61643-1. These parallel devices are intended for protection of electronic appliances against the impulse surge effects. They fully meet the demands of users for applications in three-phase power supply networks operated as TN-S, TN-C and TT systems. All varistors in P-3k devices are fitted with thermal fuses against the short and permanent overloading. P-3k units are to be connected as near to the protected electronic appliance as possible. The right function of P-3k230, P-3k400 and P-3k500 devices is indicated by three green LED diodes. The function failure of P-3k230 DS and P-3k400 DS devices is indicated by target disconnection of mechanical thermal fuses which react to the varistors overheating above c. 120°C. If one of the three thermal fuses reacts, the free-potential contact FAILURE disconnects at the same time (in case of DS version only).

Type		P-3k230, P-3k230 DS	P-3k400, P-3k400 DS	P-3k500
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III		
Nominal voltage	U_N	230 V AC		
Max. continuous operating voltage	U_C	275 V AC		
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)		
Combined impulse	U_{oc}	6 kV (L/N, L/PE) 10 kV (N/PE)		
Voltage protection level at U_{oc}	U_p	< 1,2 kV (L/N) < 1,2 kV (L/PE) < 1,2 kV (N/PE)	< 1,5 kV (L/N) < 1,5 kV (L/PE) < 1,5 kV (N/PE)	< 1,8 kV (L/N) < 1,5 kV (L/PE) < 1,5 kV (N/PE)
Power loss at winding temp. 20°C		cca 3 VA / 0,1 VA		
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)		
Back-up fuse		16 A		
LPZ		2-3		
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0		
Protection type		IP20		
Operating temperature range	ϑ	-40°C ... +80 °C		
Cross-section of the connected conductors		2,5 - 4 mm ² Cu		
Mounting on		DIN rail 35 mm		
Failure signalisation P-3k*		light on - ok / light off - failure		
Failure signalisation P-3k* DS		pushed in - ok / pushed out - failure		
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A		
Lifetime		min. 100.000 h		
Weight	m	140 g / 205 g		150 g
Article number				
P-3k*		30 105	30 101	30 102
P-3k* DS		30 106	30 103	-



Surge arrester / varistor + gas discharge tube / TYPE 3

TYPE 3 / CLASS III / TN-S / TN-C / TT / CE



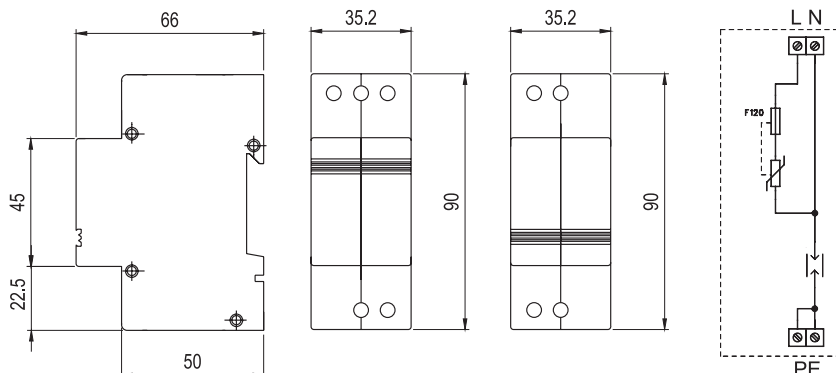
ZS-1DSM

ZS-1DSM is a single-phase surge arrester, which is designed for universal application for protection of all kinds of electrical appliances connected to L.V. power supply system against the impulse surge effects. Type ZS-1DSM is intended for use in the power supply lines, which are operated as TN-S, TN-C and TT system. ZS-1DSM meets the requirement for Type 3 surge arrester according to EN 61643-11 and IEC 61643-1. The right function is indicated by fitted green LED diode. The connection to L.V. power supply system is provided by means of screw terminals.

Type		ZS-1DSM
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III
Nominal voltage	U_N	230 V AC
Max. continuous operating voltage	U_C	275 V AC
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE)
		5 kA (N/PE)
Combined impulse	U_{OC}	6 kV (L/N, L/PE)
		10 kV (N/PE)
Voltage protection level at U_{OC}	U_P	< 1 kV (L/N)
		< 1,2 kV (L/PE)
		< 1,2 kV (N/PE)
Power loss at winding temp. 20°C		< 0,5 W
Response time	t_A	< 25 ns (L/N)
		< 100 ns (L/PE, N/PE)
Back-up fuse		16 A
Temporary overvoltage (TOV)	U_T	335 V / 5 s (L/N)
		1200 V + U_0 / 200 ms (L/PE)
LPZ		2-3
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0
Protection type		IP20
Operating temperature range	ϑ	-40°C ... +80 °C
Cross-section of the connected conductors		1,5 mm ² Cu
Mounting on		DIN rail 35 mm
Failure signalisation		light on - ok / light off - failure
Lifetime		min. 100.000 h
Weight	m	45 g
Article number		32 016

Surge arrester / varistor + gas discharge tube / TYPE 3

TYPE 3 / CLASS III / TN-S / TN-C / TT / CE



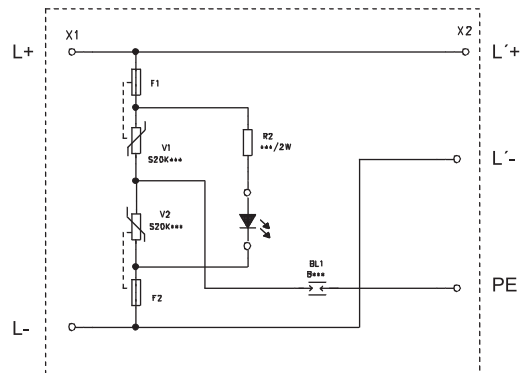
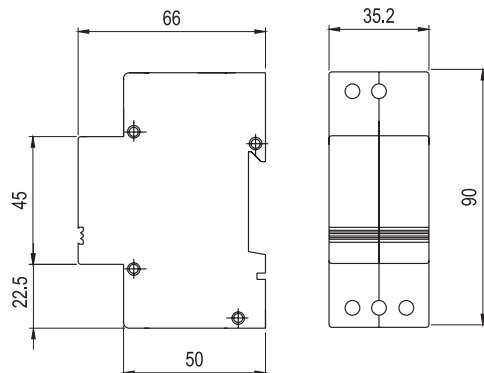
PK2 PK2 DS

PK2 is a single-phase surge arrester type 3 according to EN 61643-11 and IEC 61643-1. It is designed for universal application for protection of all kinds of electrical appliances connected to L.V. power supply system against the impulse surge effects. The device is suitable for use in the power supply lines, which are operated as TN-S, TN-C and TT system. On a special customer's demand it is possible to supply this arrester for different nominal voltages than 230V/50Hz. The function failure of varistor is indicated by target disconnection of mechanical thermal fuse which reacts to the varistor overheating above c. 120°C.

Type		PK2, PK2 DS
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III
Nominal voltage	U_N	230 V AC
Max. continuous operating voltage	U_C	275 V AC
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N, L/PE) 5 kA (N/PE)
Combined impulse	U_{OC}	6 kV (L/N, L/PE) 10 kV (N/PE)
Voltage protection level at U_{OC}	U_P	< 1 kV (L/N) < 1,2 kV (L/PE) < 1,2 kV (N/PE)
Power loss at winding temp. 20°C		< 0,5 W
Response time	t_A	< 25 ns (L/N) < 100 ns (L/PE, N/PE)
Back-up fuse		16 A
Temporary overvoltage (TOV)	U_T	335 V / 5 s (L/N) 1200 V + U_0 / 200 ms (L/PE)
LPZ		2-3
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0
Protection type		IP20
Operating temperature range	ϑ	-40°C ... +80 °C
Cross-section of the connected conductors		1,5 - 2,5 mm ² Cu
Mounting on		DIN rail 35 mm
Failure signalisation		pushed in - ok / pushed out - failure
Potential free release contact (DS) (recommended cross-section of remote monitoring max.1 mm ²)		AC: 250 V / 0,5 A, DC: 250 V / 0,1 A
Lifetime		min. 100.000 h
Weight	m	100 g
Article number		
PK2		32 030
PK2 DS		32 008

Surge arrester / varistor + gas discharge tube / TYPE 3

TYPE 3 / CLASS III / DC / CE



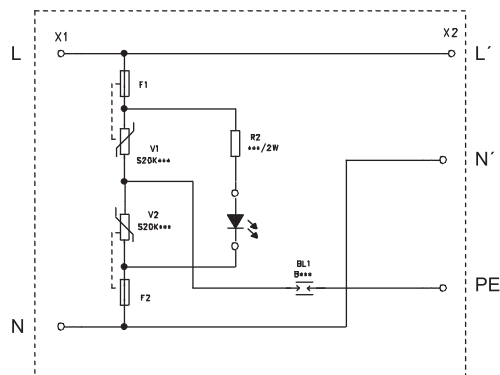
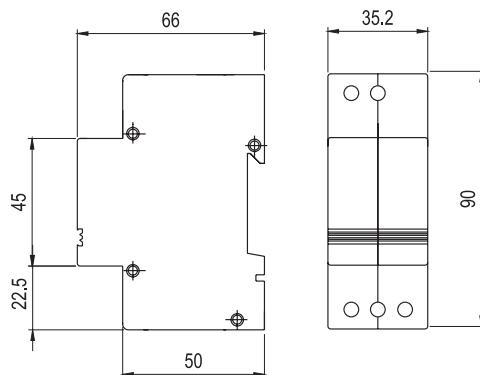
P-k16/12 DC, P-k16/24 DC, P-k16/48 DC P-k16/60 DC, P-k16/110 DC

Series of the arresters P-k16*DC is designed for protection of electronic appliances in L.V. power supply DC systems against the impulse surge effects. They are constructed for mounting on DIN rail 36mm for rated load currents 16A according to IEC 61643-1, EN 61643-11 and EN 62305 standards (arrester class III - 3rd stage protection). Right function of the in-built protective elements, MOV varistors, is signalized by green light on the front panel of the equipment.

Type		P-K16/12 DC	P-K16/24 DC	P-K16/48 DC	P-K16/60 DC	P-K16/110 DC
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III				
Network		DC				
Nominal voltage	U_N	12 V =	24 V =	48 V =	60 V =	110 V =
Max. continuous operating voltage	U_C	14,4 V =	28,8 V =	57,6 V =	72 V =	132 V =
Rated load current	I_L	16 A				
Combined impulse	U_{OC}	2 kV				
Voltage protection level at U_{OC}	U_P	< 130 V (L+/L-)	< 200 V (L+/L-)	< 370 V (L+/L-)	< 400 V (L+/L-)	< 680 V (L+/L-)
			< 600 V (L/PE)			< 800 V (L/PE)
Response time	t_A	< 25 ns (L+/L-)				
		< 100 ns (L/PE)				
Back-up fuse		16 A				
LPZ		2-3				
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0				
Protection type		IP20				
Operating temperature range	ϑ	-40°C ... +80 °C				
Cross-section of the connected conductors		2,5 mm ² Cu				
Mounting on		DIN rail 35 mm				
Failure signalisation		light on - ok / light off - failure				
Lifetime		min. 100.000 h				
Weight	m	95 g				
Article number		30 001	30 002	30 014	30 018	30 020

Surge arrester / varistor + gas discharge tube / TYPE 3

TYPE 3 / CLASS III / AC / CE



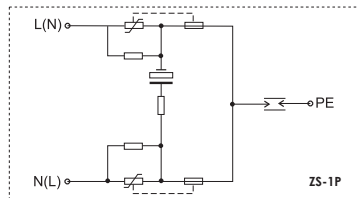
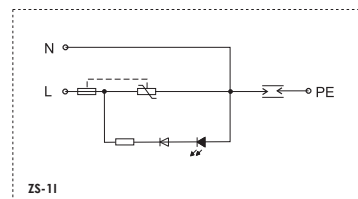
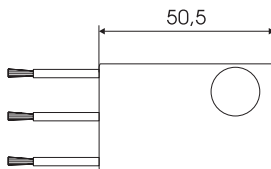
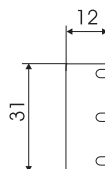
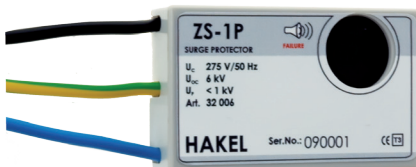
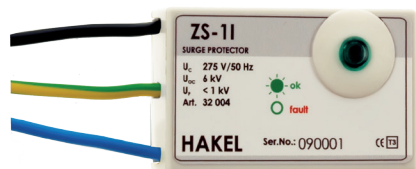
P-k16/110 AC P-k16/230 AC

Series of the arresters P-k16*AC is designed for protection of electronic appliances in L.V. power supply AC systems against the impulse surge effects. They are constructed for mounting on DIN rail 36mm for rated load currents 16A according to IEC 61643-1, EN 61643-11 and EN 62305 standards (arrester class III - 3rd stage protection). Right function of the in-built protective elements, MOV varistors, is signalized by green light on the front panel of the equipment.

Type		P-K16/110 AC	P-K16/230 AC
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III	
Network		AC	
Nominal voltage	U_N	110 V AC	230 V AC
Max. continuous operating voltage	U_C	132 V AC	275 V AC
Rated load current	I_L	16 A	
Combined impulse	U_{OC}	6 kV	
Voltage protection level at U_{OC}	U_P	< 850 V (L/N) < 800 V (L,N/PE)	< 1300 V (L/N) < 1200 V (L,N/PE)
Response time	t_A	< 25 ns (L/N) < 100 ns (L,N/PE)	
Back-up fuse		16 A	
Temporary overvoltage (TOV)	U_T	-	335 V / 5 s (L/N) 1200 V + U_0 / 0,2 s (L/PE)
LPZ		2-3	
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0	
Protection type		IP20	
Operating temperature range	ϑ	-40°C ... +80 °C	
Cross-section of the connected conductors		2,5 mm ² Cu	
Mounting on		DIN rail 35 mm	
Failure signalisation		light on - ok / light off - failure	
Lifetime		min. 100.000 h	
Weight	m	95 g	
Article number		30 015	30 008

Surge arrester / varistor + gas discharge tube / TYPE 3

TYPE 3 / CLASS III / TN-S / CE



ZS-11

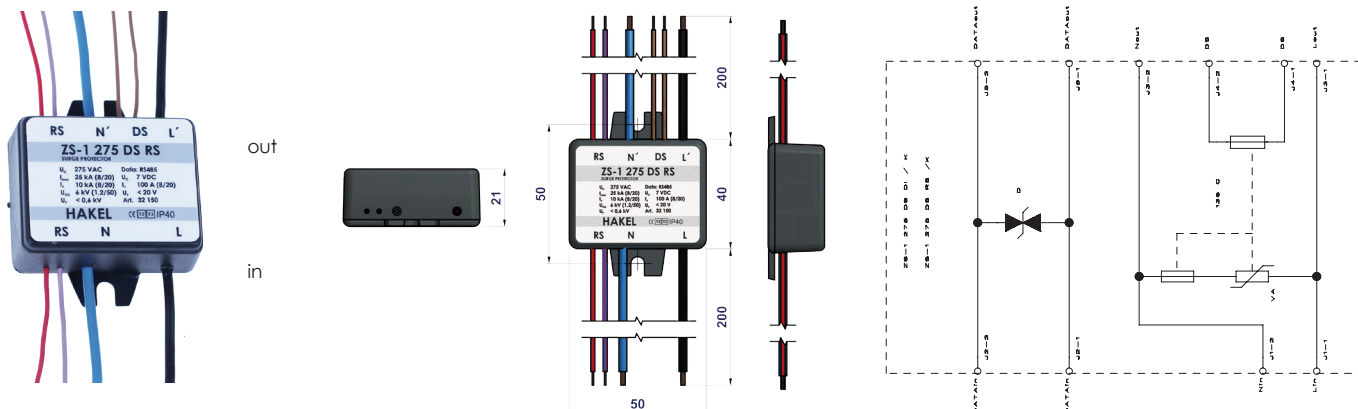
ZS-1P

ZS-11, ZS-1P are the surge arresters type 3 according to EN 61643-11 and IEC 61643-1 and IEC 61643-1 designed for installation into electrical installation systems, e.g.: cable ducts and flush-mounted sockets as an additional protection. These devices are suitable supplements of socket distribution which are protected by PI-k protector. The right function of ZS-11 type is indicated by green LED diode. When the indicator is dark, the device must be replaced or technically checked. ZS-1P contains an acoustic fault indicator (buzzer).

Type		ZS-11	ZS-1P
Test class according to EN 61643-11 ed.2 and IEC 61643-1		TYPE 3, CLASS III	
Nominal voltage	U_N	230 V AC	
Max. continuous operating voltage	U_C	275 V AC	
Nominal discharge current $I_n(8/20)$	I_n	3 kA (L/N), L(N)/PE	
Combined impulse	U_{OC}	6 kV (L/N, L(N)/PE)	
Voltage protection level at U_{OC}	U_P	< 1 kV (L/N)	< 1,3 kV (L/N)
		< 1,2 kV (L(N)/PE)	< 1 kV (L(N)/PE)
Response time	t_A	< 25 ns (L/N)	
		< 100 ns (L/PE, N/PE)	
Back-up fuse		16 A	
Temporary overvoltage (TOV)	U_T	335 V / 5 s (L/N)	
		1200 V + U_0 / 200 ms (L/PE)	
LPZ		2-3	
Housing material		Polyamid PA6, UL94 V-0	
Protection type		IP20	
Operating temperature range	ϑ	-40°C ... +80 °C	
Failure signalisation		light on - ok / light off - failure	inbuilt piezosiren
Lifetime		min. 100.000 h	
Weight	m	20 g	30 g
Article number		32 004	32 006

Surge arrester for LED lighting protection / varistor / TYPE 2+ TYPE 3

TYPE 2+3 / CLASS II+III / TN / CE

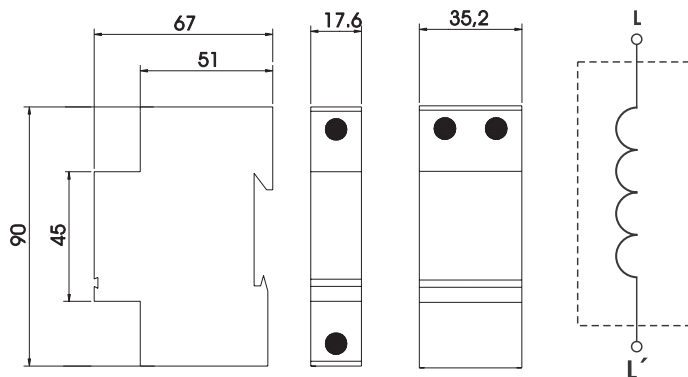


ZS-1 275 DS RS
ZS-1 275 DS DI

ZS-1 275 DS RS and ZS-1 275 DS DI are surge arresters Type 2+3 (TYPE 3 protects the device only to 5m lead) according to EN 61643-11 and EN 62305 designed for LED lighting protection for installations largely e.g. in tunnels, properties and premises, street lights etc. Efficiently protect both the input supply voltage and the data communication lines for the remote control of lighting fixture (protocol RS485 eventually DALI (DI)). Both types are equipped with the internal disconnecting signal contacts (DS), which are activated when the inbuilt varistor overheats above 136°C. The way to connect to a given application is by the pull-wire terminals.

Type		ZS-1 275 DS RS	ZS-1 275 DS DI
Network part			
Nominal voltage	U _N	230 V AC	
Max. continous operating voltage	U _C	275 V AC	
Max. discharge current (8/20)	I _{max}	25 kA	
Nominal discharge current (8/20)	I _n	10 kA	
Combined impulse	U _{OC}	6 kV	
Voltage protection level at I _n	U _P	< 0,65 kV	
Voltage protection level at U _{OC}	U _P	< 0,6 kV	
Response time	t _A	< 25 ns	
Max. backup fuse		16 A	
Temporary overvoltage TOV	U _T	335V/5 s	
Lifetime		min. 100.000 h	
Fault indication (DS)		potential free contact max. 230 V AC/0,5 A 230VAC/0,5 A	
IP code		IP45 (standard)	
		IP65 (only on special request)	
Data part			
- max. continous operating voltage	U _C	7 VDC	28 VDC
- max. discharge current	I _{FSM}	200 A/8,3 ms	200 A/8,3 ms
- Nominal discharge current (8/20)	I _n	100 A	100 A
- Voltage protection level at I _n	U _P	< 20 V	< 40 V
- Protocol of data transmission		RS 485	DALI
Weight	m	55 g	
Length of supply lead	l	200 mm (conductor 1,5 mm² and conductor 0,35 mm²)	
Recommended working/position		any	
Mounting on		wall mounted or plate mounted by two screws o 4 mm	
Article number (IP45 version)		32 150	32152
Article number (IP65 version)		32 154	32155

Decoupling inductors

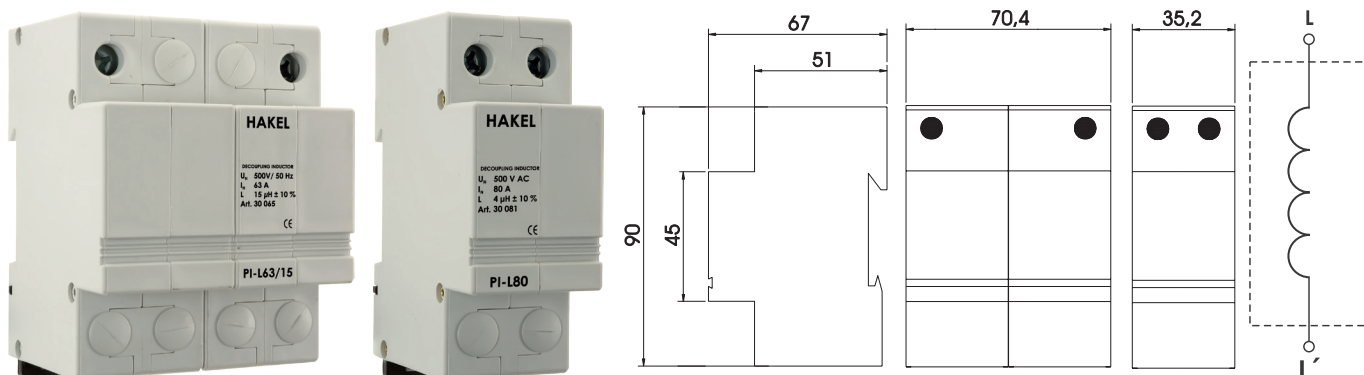


PI-L16, PI-L16/15 PI-L32, PI-L32/15

Decoupling inductors are intended for rated load currents within the range of 16 and 32A. These inductors, sometimes also called decoupling impedance, ensure the energy coordination between the arresters type 1 and type 2 or the arresters type 2 and type 3 according to IEC 1024-1 and EN 61643-11 and IEC 61643-1, especially in the places where there is no adequate distance between the arresters (e.g. when there are two successive arrester types placed in one switchboard). If the energy coordination of surge protection is not achieved, the lightning current impulse can damage some arrester type of the protection cascade. If there is at least 5m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), this section impedance can be considered as adequate.

Type		PI-L16, PI-L16/15	PI-L32, PI-L32/15
Nominal voltage	U_N	500 V AC	
Rated load current	I_L	16 A	32 A
Inductance	L	$6 \mu H \pm 10\% / 15 \mu H \pm 10\%$	
DC resistance		$< 0,01 \Omega$	
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0	
Protection type		IP20	
Operating temperature range	ϑ	$-40^\circ C \dots +80^\circ C$	
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		4 mm ²	6 mm ²
Max. back-up fuse		16 A	32 A
Lifetime		min. 100.000 h	
Weight	m	141 g / 157 g	157 g / 330 g
Article number		30 000, 30 036	30 030, 30 035

Decoupling inductors



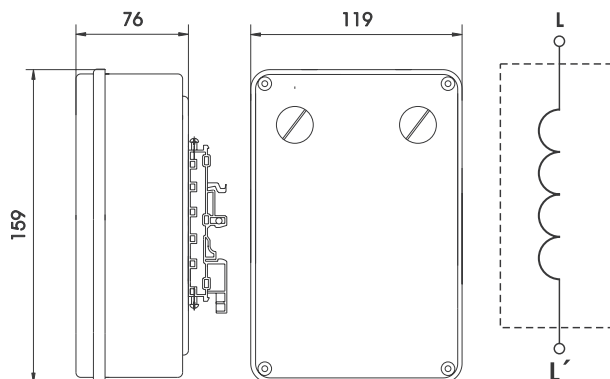
PI-L63/15

PI-L63, PI-L80

Decoupling inductors are intended for rated load currents within the range of 63 and 80A. These inductors, sometimes also called decoupling impedance, ensure the energy coordination between the arresters type 1 and type 2 or the arresters type 2 and type 3 according to IEC 1024-1 and EN 61643-11 and IEC 61643-1, especially in the places where there is no adequate distance between the arresters (e.g. when there are two successive arrester types placed in one switchboard). If the energy coordination of surge protection is not achieved, the lightning current impulse can damage some arrester type of the protection cascade. If there is at least 5m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), this section impedance can be considered as adequate.

Type		PI-L63, PI-L63/15	PI-L80
Nominal voltage	U_N	500 V AC	
Rated load current	I_L	63 A	80 A
Inductance	L	$6 \mu H \pm 10\% / 15 \mu H \pm 10\%$	$4 \mu H \pm 10\%$
DC resistance		$< 0,01 \Omega$	
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0	
Protection type		IP20	
Operating temperature range	ϑ	$-40^\circ C \dots +80^\circ C$	
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		16 mm ²	25 mm ²
Max. back-up fuse		63 A	80 A
Lifetime		min. 100.000 h	
Weight	m	360 g / 630 g	360 g
Article number		30 060, 30 065	30 081

Decoupling inductors



PI-L120

Decoupling inductor is intended for the rated load current of 120A. This inductor, sometimes also called decoupling impedance, ensures the energy coordination between the arresters type 1 and type 2 or the arresters type 2 and type 3 according to IEC 1024-1 and EN 61643-11 and IEC 61643-1, especially in the places where there is no adequate distance between the arresters (e.g. when there are two successive arrester types placed in one switchboard). If the energy coordination of surge protection is not achieved, the lightning current impulse can damage some arrester type of the protection cascade. If there is at least 5m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), this section impedance can be considered as adequate.

Type		PI-L120
Nominal voltage	U_N	500 V AC
Rated load current	I_L	120 A
Inductance	L	$6 \mu\text{H} \pm 10\%$
DC resistance		$< 0,01 \Omega$
Housing material		Polyamid PA6, UL94 V-0, UL94 V-0
Protection type		IP20
Operating temperature range	ϑ	$-40^\circ\text{C} \dots +80^\circ\text{C}$
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		50 mm^2
Max. back-up fuse		120 A
Lifetime		min. 100.000 h
Weight	m	1153 g
Article number		30 120