

hakel[®]

Hz in Hearts

Surge Protection Devices

selection of data sheets



Assortment of Hakel products:

Surge protection devices (SPD)

Surge protection devices + EMI filters (SPD+EMI)

Surge protection devices for photovoltaic applications (SPD PV)

Surge protection devices for it power supply systems (SPD IT)

Voltage limiting devices (VLD)

Gas discharge tubes for equipotential bonding (GDT)

Insulation monitoring devices (IMD)

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HAKEL spol. s r.o. – company profile

HAKEL spol. s r.o. was founded by Ing. Jaroslav Hudec, PhD., on October 18, 1994, in Hradec Kralove. From the very beginning, it has been a purely Czech company, which ranks among the leading manufacturers of surge protection devices and insulation monitoring devices.

We produce surge protection devices not only for residential construction, but they are also used in industry (oil and gas pipelines, photovoltaics, power plants and railways). Our products protect various technologies, machines, appliances and equipment worldwide against overvoltage.

At the same time, we develop and manufacture insulation monitoring devices for isolated IT power supply systems. We provide complete A to Z solutions for insulation monitoring in hospitals, industry and special applications, helping to protect not only equipment, but more importantly human lives.

In addition to its manufacturing and business activities, HAKEL spol. s r.o. supports individuals, foundations, schools, nurseries, theatres and other organisations. Today the company is managed by Bc. Pavel Hudec, son of the founder, as the sole owner.

Introducing the new website

The current edition of the surge protection devices selection mainly serves as a support material for those of you who prefer a brief paper form of technical specifications of individual products.

However, if you want a complete overview of all technical data, product variants, relevant diagrams, installation instructions and other accompanying materials, please visit our brand new website www.hakel.com.

On the website, you will find not only a complete product portfolio, but you can also easily search by parameters or select according to the specific solution. This will allow you to quickly find products fully suitable for your project or construction. The product data sheets are generated in real-time from the database, which is managed by the Development Department of HAKEL company. This means that you always have the latest materials at your disposal.

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List of products according to categories

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HLA50-255/2+0 S	10 976	10
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Product types **HLSA12,5-*** we also supply in a **solid design** (the product name then excludes „M“). Here the U_c is not limited to 275 V AC, as we offer voltage levels ***75, 150, 275, 320, 385, 440 and 600 V AC**.

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HSA-275/3+0 M S	27 093	32
HSA-275/3+1 M	27 084	33
HSA-275/3+1 M S	27 094	33
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Product types **HSA-*** we supply both the **modular versions (M)** and **solid designs** in voltage levels ***75, 150, 275, 320, 385, 440 and 600 V AC**. In addition, the U_c **720 and 850 V AC** can be offered in solid versions.

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HSAF16/60VDC	30 146	39
HSAF16/120VDC	30 147	39
HSAF16/220VDC	30 148	39
HSAF16/6VDC S	30 260	40
HSAF16/12VDC S	30 261	40
HSAF16/24VDC S	30 262	40
HSAF16/48VDC S	30 263	40
HSAF16/60VDC S	30 264	40
HSAF16/120VDC S	30 265	40
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Objects with lightning protection level I and II

MAIN SWITCHBOARD

T1 LPZ 0-1 / T1+T2 LPZ 0-1 and higher

SUBSIDIARY SWITCHBOARD

T2+T3 LPZ 0-3

END DEVICE

T3 LPZ 2-3

Lightning arrester T1
Lightning and surge arrester T1+T2

INSTALLATION

Transformer stations, substations, electricity meter switchboard, main switchboard.

Hospitals, banks, transmission points of GSM & BTS, water stations, power plants, airport control towers, buildings with danger of explosion, bigger industrial buildings, buildings with particular importance, bigger administrative buildings, schools, supermarkets, cathedrals etc.

Surge arrester T2+T3

INSTALLATION

Subsidiary switchboard, technical rooms, subsidiary technological switchboards, data centers or control cabinets.

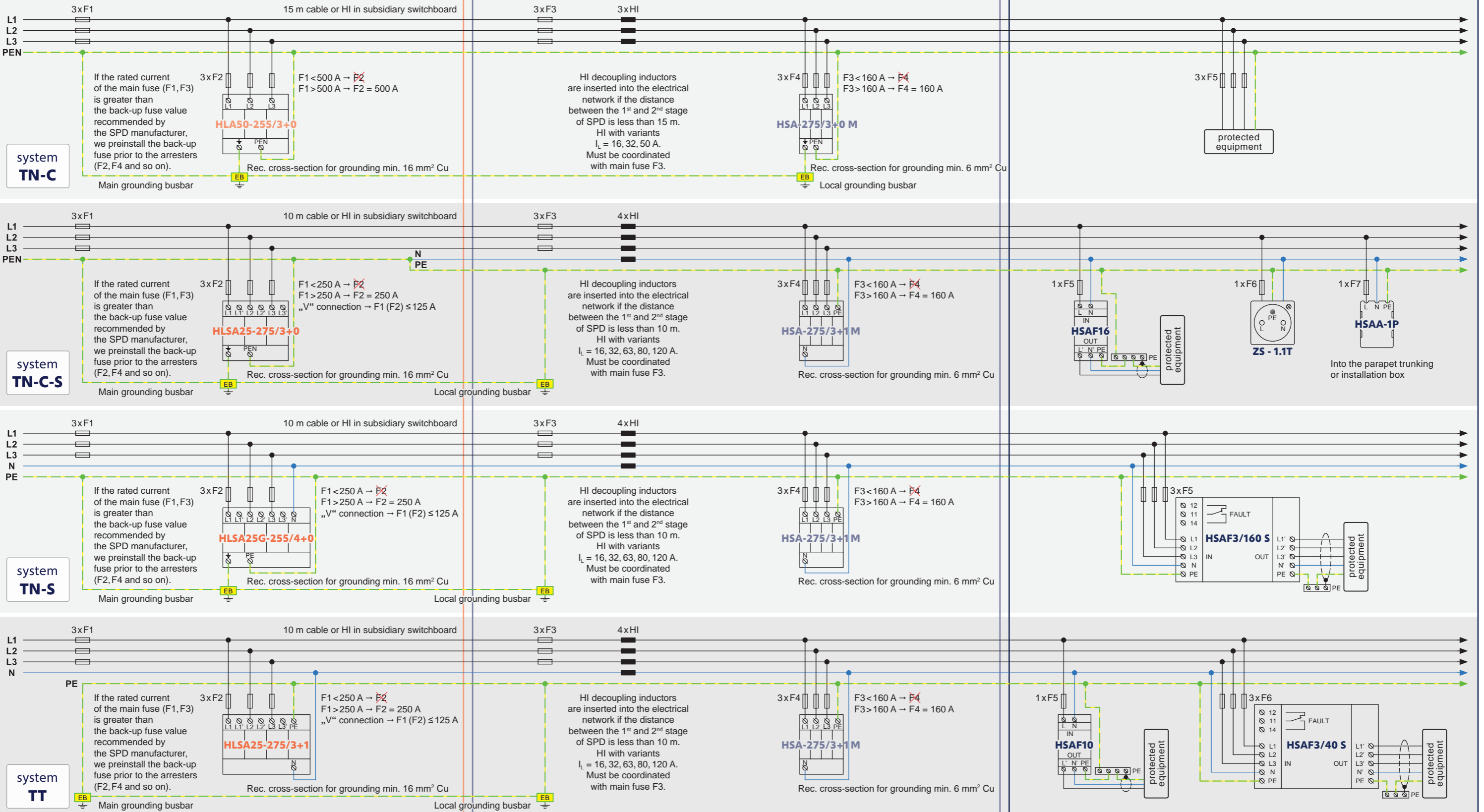
The same object types as in the case of the main switchboard.

Surge arrester + EMI filter T3

INSTALLATION to the switchboard, which is closest to the protected equipment.

In case of electronic control protection, the installation is directly to the appliance.

Outlet circuits which are longer than 20 m. Flush-mounted sockets and cable ducts. It is recommended to install SPD into the outlet circuit to every fourth socket or to the point of supply. This installation eliminates induced overvoltage which is ending into the object's service cables.



MAIN SWITCHBOARD

T1+T2 LPZ 0-1 and higher

SUBSIDIARY SWITCHBOARD

T2+T3 LPZ 1-3

END DEVICE

T3 LPZ 2-3

Lightning and surge arrester T1+T2

INSTALLATION

Transformer stations, substations, electricity meter switchboard, main switchboard.

Smaller industrial buildings, administrative buildings, residential buildings, agricultural buildings, family houses, common storehouses etc.

Surge arrester T2+T3

INSTALLATION

Subsidiary switchboard, technical rooms, subsidiary technological switchboards, data centers or control cabinets.

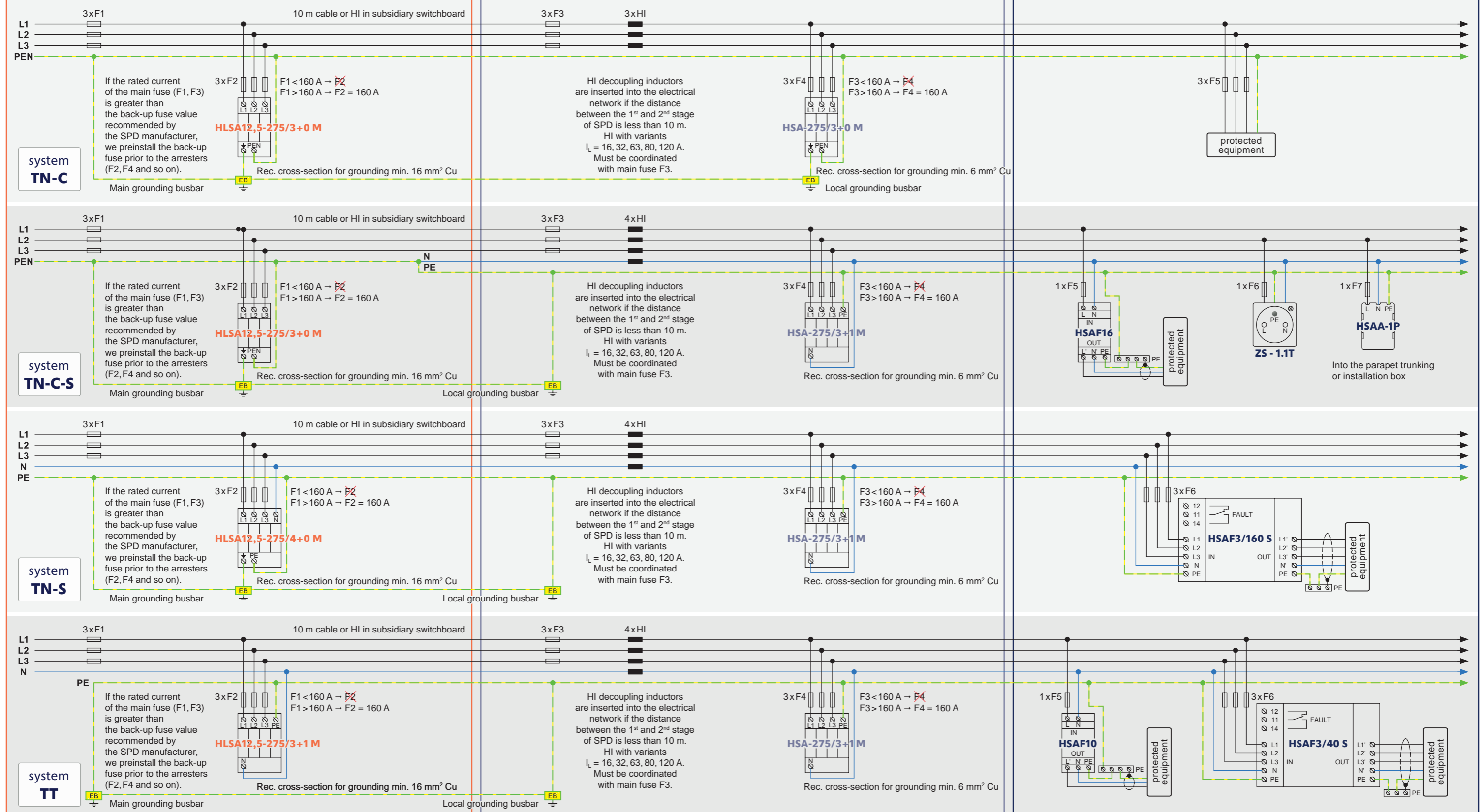
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Together we make the world a safer place Surge protection device HAKEL



Insulation monitoring devices



HIG99 + HIG99 KM CAN

Lightning arresters



HLA50-255/3+0

Lightning and surge arresters



HLSA25G-255/4+0

Surge arresters



HSA-275/3+1 M

Surge arresters with HF filter



HSAF16 S

Surge arresters



HSAA-1P

Photovoltaic systems



HLSA6,5 PV 1000 M

Surge protection for the transmission of data and information signals



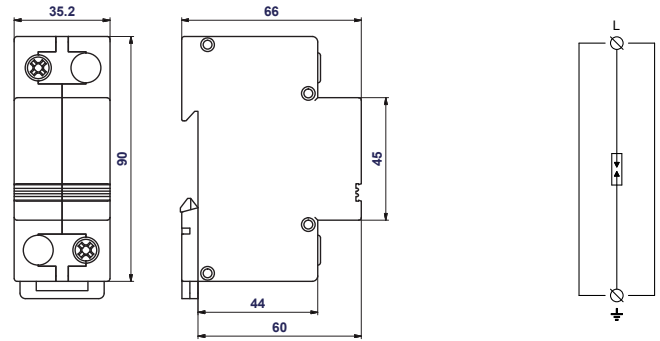
HDT2/24B

HT-NET PoE+ 6cat

Coaxial protection



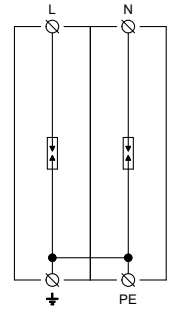
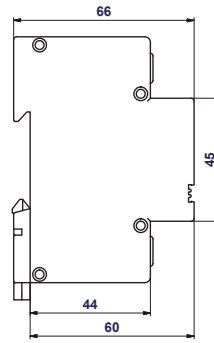
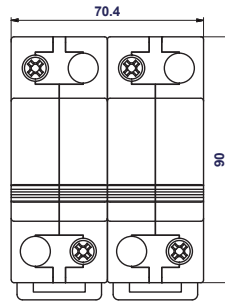
KO - 4GN



HLA50-255 (LED) (S), HLA50-440 (LED) (S)

- Lightning impulse current arresters type T1 ensure the equipotential bonding and eliminate the effects of lightning current in single-phase and three-phase power supply systems.
- Products contain multiple non-exhausting spark gaps, thanks to which they are able to discharge the highest lightning impulse current.
- Suitable for objects with considerable levels of protection LPL I and LPL II, such as big industrial complexes and properties of particular importance – hospitals, banks, power plants.
- Installed as close as possible the overhead line enters the building
- i.e. the electric power substation, electrometer or the main distribution boards.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **LED** indication specifies a version with LED fault signalisation.
- **S** indication specifies a version with remote monitoring and LED fault signalisation.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HLA50-255, HLA50-255 LED, HLA50-255 S	HLA50-440, HLA50-440 LED, HLA50-440 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T1
System			TN
Number of poles			1
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		255 V
Impulse discharge current for class I test (10/350)	I_{imp}		50 kA
Charge	Q		25 As
Specific energy for class I test	W/R		625 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n		50 kA
Voltage protection level at I_{imp}	U_p	< 2 kV	< 2.5 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V	581 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V	762 V
Maximal back-up fuse			500 A gL/gG
Short-circuit current rating at maximum back-up fuse	I_{SCCR}		25 kA_{rms}
Follow current interrupt rating	I_{fi}	25 kA_{rms}	3 kA_{rms}
Housing material			Polyamid PA6, UL94 V-0
Degree of protection			IP20
Operating temperature	ϑ		-40 ÷ 70 °C
Humidity range	RH		5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S		6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)			2.5 ÷ 16 mm ²
Operating position			Any
Importance of local signaling – LED version			OK – green light on, FAULT – green light off
Importance of local signaling – S version			OK – green light on, FAULT – red light on
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)			AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Article number	HLA50-*	10 970	10 950
	HLA50-* LED	10 979	10 962
	HLA50-* S	10 975	10 956



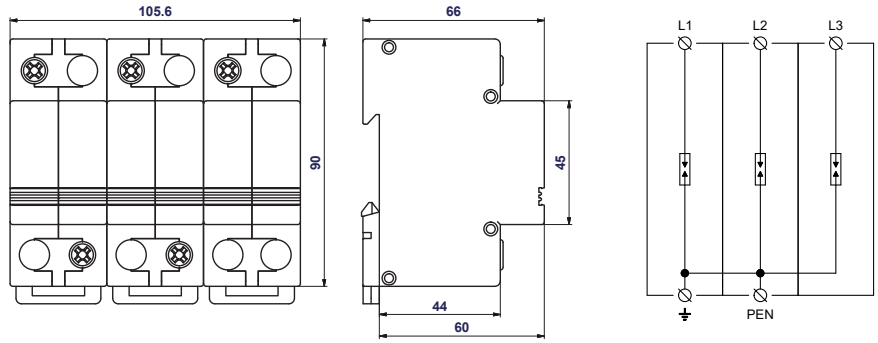
HLA50-255/2+0 (LED) (S), HLA50-440/2+0 (LED) (S)

- Lightning impulse current arresters type T1 ensure the equipotential bonding and eliminate the effects of lightning current in single-phase and three-phase power supply systems.
- Products contain multiple non-exhausting spark gaps, thanks to which they are able to discharge the highest lightning impulse current.
- Suitable for objects with considerable levels of protection LPL I and LPL II, such as big industrial complexes and properties of particular importance – hospitals, banks, power plants.
- Installed as close as possible the overhead line enters the building

i.e. the electric power substation, electrometer or the main distribution boards.

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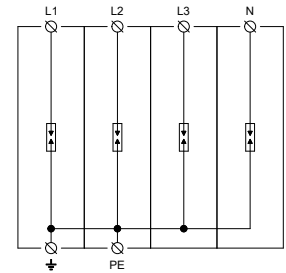
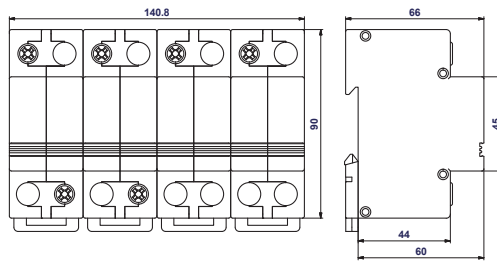
Type		HLA50-255/2+0, HLA50-255/2+0 LED, HLA50-255/2+0 S	HLA50-440/2+0, HLA50-440/2+0 LED, HLA50-440/2+0 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T1
System			TN-S
Number of poles			2
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		255 V
Impulse discharge current for class I test (10/350)	I_{imp}		50 kA
Charge	Q		25 As
Specific energy for class I test	W/R		625 kJ/Ω
Total discharge current (10/350) L+N->PE	I_{Total}		100 kA
Nominal discharge current for class II test (8/20)	I_n		50 kA
Voltage protection level at I_{imp}	U_p	< 2 kV	< 2.5 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V	581 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V	762 V
Maximal back-up fuse			500 A gL/gG
Short-circuit current rating at maximum back-up fuse	I_{SCCR}		25 kA _{rms}
Follow current interrupt rating	I_{fi}	25 kA _{rms}	3 kA _{rms}
Housing material			Polyamid PA6, UL94 V-0
Degree of protection			IP20
Operating temperature	ϑ		-40 ÷ 70 °C
Humidity range	RH		5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S		6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)			2.5 ÷ 16 mm ²
Operating position			Any
Importance of local signaling – LED version			OK – green light on, FAULT – green light off
Importance of local signaling – S version			OK – green light on, FAULT – red light on
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)			AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Article number	HLA50-*/2+0		10 971
	HLA50-*/2+0 LED		10 980
	HLA50-*/2+0 S		10 976
			10 952
			10 963
			10 958



HLA50-255/3+0 (LED) (S), HLA50-440/3+0 (LED) (S)

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Type		HLA50-255/3+0, HLA50-255/3+0 LED, HLA50-255/3+0 S	HLA50-440/3+0, HLA50-440/3+0 LED, HLA50-440/3+0 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T1
System			TN-C
Number of poles			3
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		255 V
Impulse discharge current for class I test (10/350)	I_{imp}		50 kA
Charge	Q		25 As
Specific energy for class I test	W/R		625 kJ/Ω
Total discharge current (10/350) L1+L2+L3->PEN	I_{Total}		150 kA
Nominal discharge current for class II test (8/20)	I_n		50 kA
Voltage protection level at I_{imp}	U_p	< 2 kV	< 2.5 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V	581 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V	762 V
Maximal back-up fuse			500 A gL/gG
Short-circuit current rating at maximum back-up fuse	I_{SCCR}		25 kA_{rms}
Follow current interrupt rating	I_{fi}	25 kA_{rms}	3 kA_{rms}
Housing material			Polyamid PA6, UL94 V-0
Degree of protection			IP20
Operating temperature	ϑ		-40 ÷ 70 °C
Humidity range	RH		5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S		6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)			2.5 ÷ 16 mm ²
Operating position			Any
Importance of local signaling – LED version			OK – green light on, FAULT – green light off
Importance of local signaling – S version			OK – green light on, FAULT – red light on
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)			AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Article number	HLA50-*/3+0		10 972
	HLA50-*/3+0 LED		10 981
	HLA50-*/3+0 S		10 977
			10 953
			10 964
			10 959



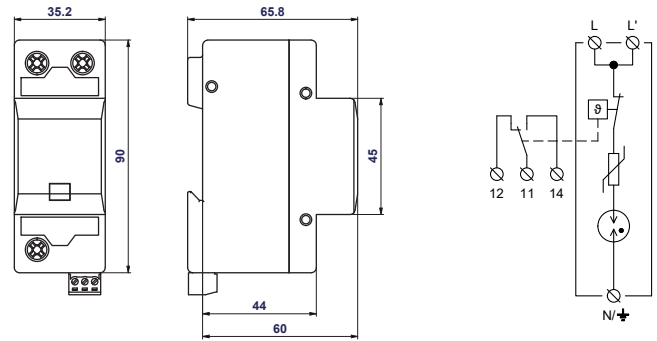
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- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

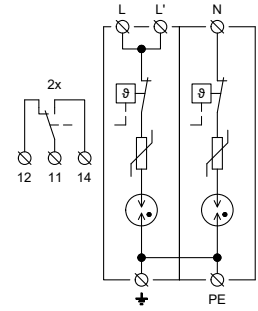
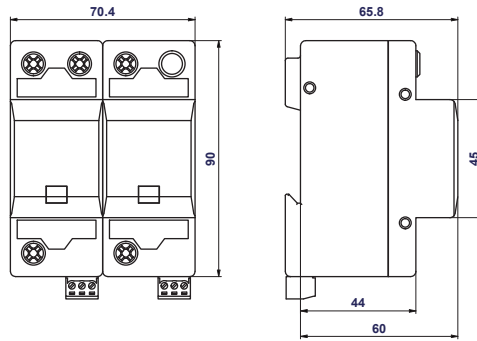
Type		HLA50-255/4+0, HLA50-255/4+0 LED, HLA50-255/4+0 S	HLA50-440/4+0, HLA50-440/4+0 LED, HLA50-440/4+0 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T1
System			TN-S
Number of poles			4
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		255 V
Impulse discharge current for class I test (10/350)	I_{imp}		50 kA
Charge	Q		25 As
Specific energy for class I test	W/R		625 kJ/Ω
Total discharge current (10/350) L1+L2+L3+N->PE	I_{Total}		200 kA
Nominal discharge current for class II test (8/20)	I_n		50 kA
Voltage protection level at I_{imp}	U_p	< 2 kV	< 2.5 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V	581 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V	762 V
Maximal back-up fuse			500 A gL/gG
Short-circuit current rating at maximum back-up fuse	I_{SCCR}		25 kA _{rms}
Follow current interrupt rating	I_{fi}	25 kA _{rms}	3 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 70 °C	
Humidity range	RH	5 ÷ 95 %	
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)	
Clamp fastening range (stranded conductor)		2.5 ÷ 16 mm ²	
Operating position		Any	
Importance of local signaling – LED version		OK – green light on, FAULT – green light off	
Importance of local signaling – S version		OK – green light on, FAULT – red light on	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 0.5 A, DC: 250 V / 0.1 A	
Article number	HLA50-*/4+0	10 973	10 955
	HLA50-*/4+0 LED	10 982	10 965
	HLA50-*/4+0 S	10 978	10 961



HLSA25G-255 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

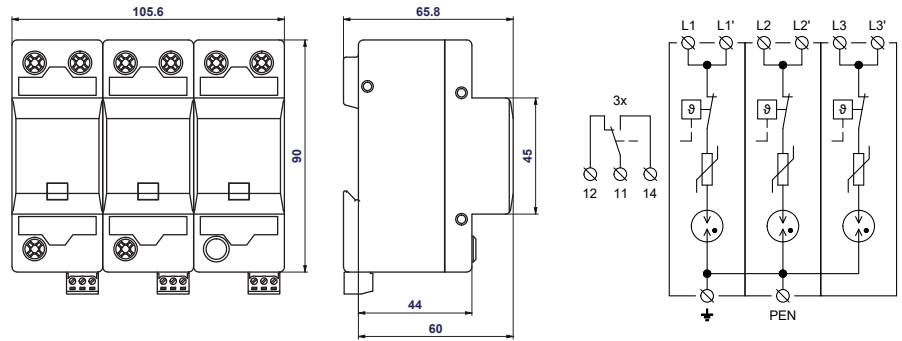
Type		HLSA25G-255, HLSA25G-255 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN
Number of poles		1
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	255 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		250 A gL/gG
Maximal back-up fuse („V“ connection)		125 A gL/gG
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number	HLSA25G-255	10 462
	HLSA25G-255 S	10 466



HLSA25G-255/2+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

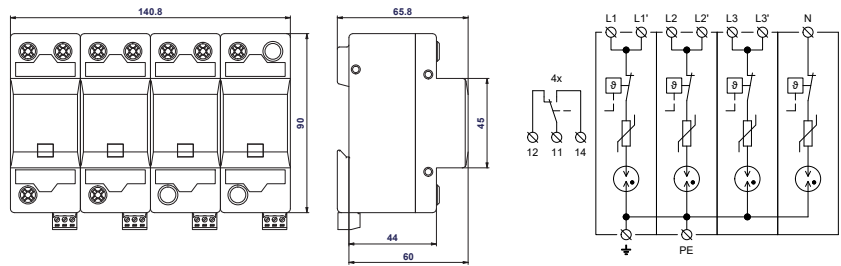
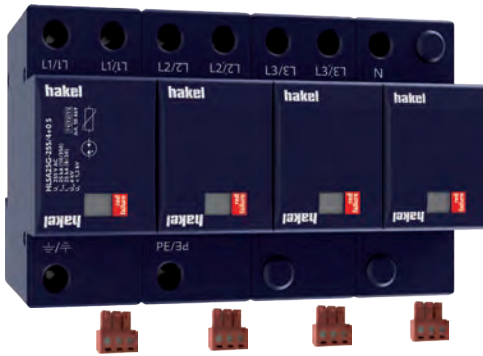
Type	HLSA25G-255/2+0, HLSA25G-255/2+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S, TT	
Number of poles	2	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	255 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Total discharge current (10/350) L+N->PE	I_{Total}	50 kA
Total discharge current (8/20) L+N->PE	I_{Total}	100 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	250 A gL/gG	
Maximal back-up fuse („V“ connection)	125 A gL/gG	
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	θ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	2.5 ÷ 25 mm ²	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HLSA25G-255/2+0	10 463
	HLSA25G-255/2+0 S	10 467



HLSA25G-255/3+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

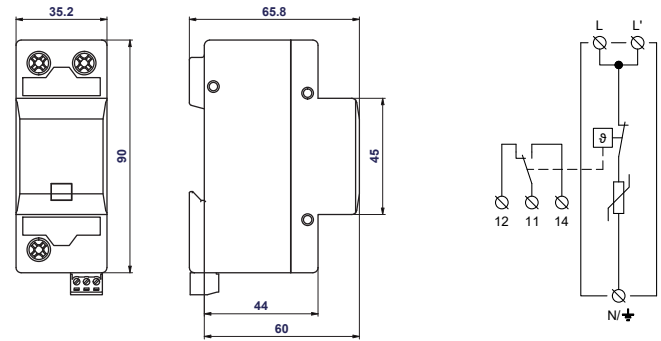
Type	HLSA25G-255/3+0, HLSA25G-255/3+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN-C
Number of poles		3
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	255 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Total discharge current (10/350) L1+L2+L3->PEN	I_{Total}	75 kA
Total discharge current (8/20) L1+L2+L3->PEN	I_{Total}	150 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		250 A gL/gG
Maximal back-up fuse („V“ connection)		125 A gL/gG
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number	HLSA25G-255/3+0	10 464
	HLSA25G-255/3+0 S	10 468



HLSA25G-255/4+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

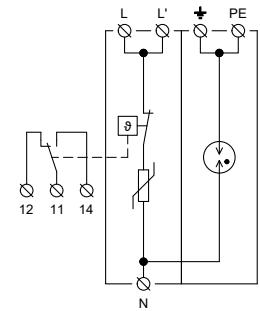
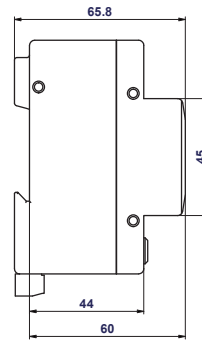
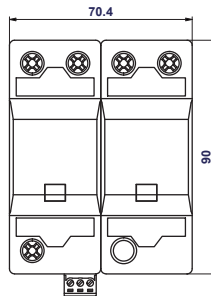
Type	HLSA25G-255/4+0, HLSA25G-255/4+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN
Number of poles		1
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		250 A gL/gG
Maximal back-up fuse („V“ connection)		125 A gL/gG
Residual current	I_{PE}	≤ 1 400 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	θ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number	HLSA25G-255/4+0	10 465
	HLSA25G-255/4+0 S	10 469



HLSA25-275 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

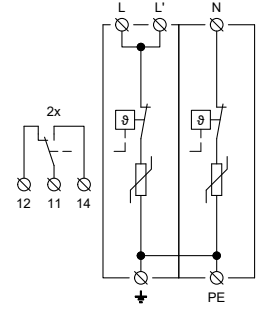
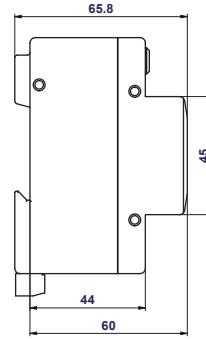
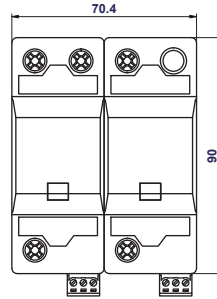
Type	HLSA25-275, HLSA25-275 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN	
Number of poles	1	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	250 A gL/gG	
Maximal back-up fuse („V“ connection)	125 A gL/gG	
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	2.5 ÷ 25 mm ²	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HLSA25-275	10 450
	HLSA25-275 S	10 456



HLSA25-275/1+1 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

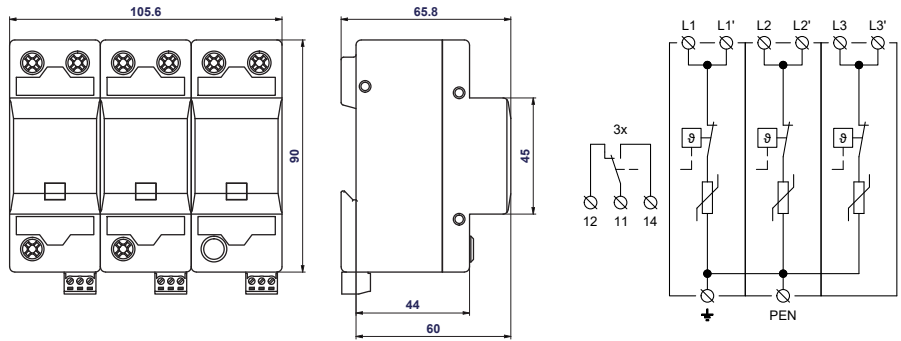
Type	HLSA25-275/1+1, HLSA25-275/1+1 S		
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3	
System		TN-S, TT	
Number of poles		2	
Rated operating AC voltage	U_N	230 V	
Maximum continuous operating voltage AC	U_C	275 V	
Maximum discharge current (8/20)	I_{max}	50 kA	
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA (L/N)	50 kA (N/PE)
Charge	Q	12.5 As (L/N)	25 As (N/PE)
Specific energy for class I test	W/R	156 kJ/Ω (L/N)	625 kJ/Ω (N/PE)
Total discharge current L+N->PE	I_{Total}	50 kA (10/350)	100 kA (8/20)
Nominal discharge current for class II test (8/20)	I_n	25 kA	
Open circuit voltage of the combination wave generator	U_{OC}	6 kV	
Voltage protection level at I_n	U_p	< 1.2 kV (L/N)	< 1.5 kV (N/PE)
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Maximal back-up fuse		250 A gL/gG	
Maximal back-up fuse („V“ connection)		125 A gL/gG	
Residual current	I_{PE}	≤ 5 μA	
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 70 °C	
Humidity range	RH	5 ÷ 95 %	
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)	
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²	
Operating position		Any	
Importance of local signaling		OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HLSA25-275/1+1	10 451	
	HLSA25-275/1+1 S	10 457	



HLSA25-275/2+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

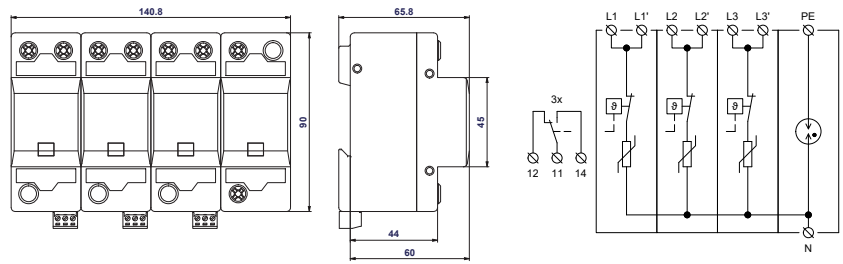
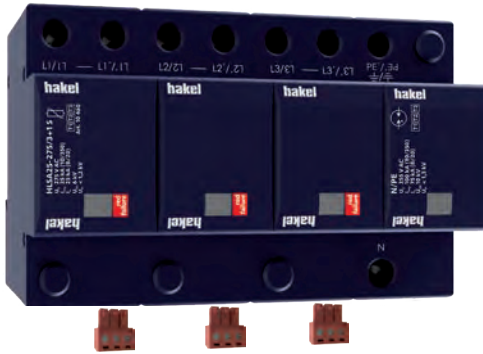
Type	HLSA25-275/2+0, HLSA25-275/2+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN-C
Number of poles		3
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Total discharge current (10/350) L1+L2+L3->PEN	I_{Total}	75 kA
Total discharge current (8/20) L1+L2+L3->PEN	I_{Total}	150 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		250 A gL/gG
Maximal back-up fuse („V“ connection)		125 A gL/gG
Residual current	I_{PE}	≤ 300 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number	HLSA25-275/2+0	10 452
	HLSA25-275/2+0 S	10 458



HLSA25-275/3+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

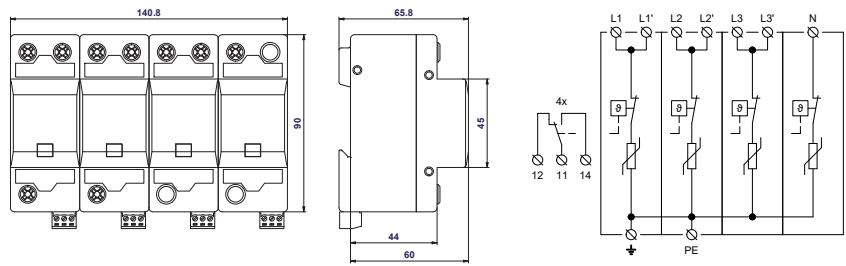
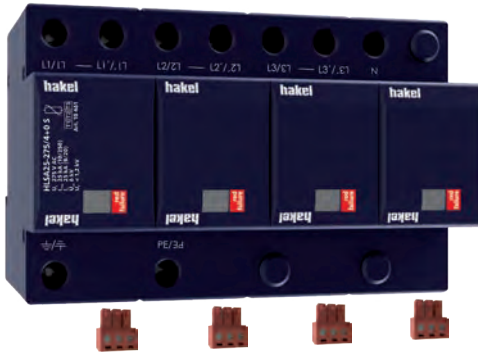
Type	HLSA25-275/3+0, HLSA25-275/3+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-C	
Number of poles	3	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Total discharge current (10/350) L1+L2+L3->PEN	I_{Total}	75 kA
Total discharge current (8/20) L1+L2+L3->PEN	I_{Total}	150 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	250 A gL/gG	
Maximal back-up fuse („V“ connection)	125 A gL/gG	
Residual current	I_{PE}	≤ 300 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	2.5 ÷ 25 mm ²	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HLSA25-275/3+0	10 453
	HLSA25-275/3+0 S	10 459



HLSA25-275/3+1 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

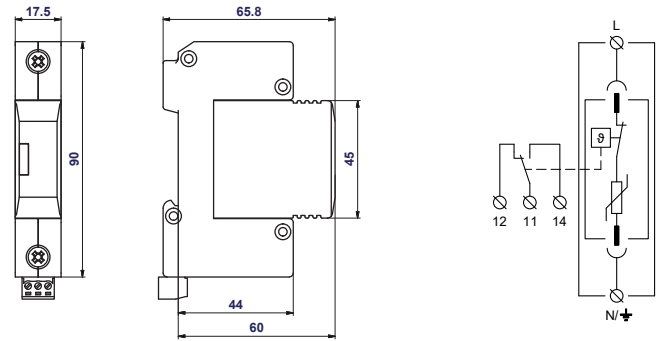
Type	HLSA25-275/3+1, HLSA25-275/3+1 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S, TT	
Number of poles	4	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA (L/N) 100 kA (N/PE)
Charge	Q	12.5 As (L/N) 2 500 kJ/Ω (N/PE)
Specific energy for class I test	W/R	156 kJ/Ω (L/N) 2 500 kJ/Ω (N/PE)
Total discharge current L1+L2+L3+N->PE	I_{Total}	100 kA (10/350) 150 kA (8/20)
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV (L/N) < 1.5 kV (N/PE)
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse		250 A gL/gG
Maximal back-up fuse („V“ connection)		125 A gL/gG
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number	HLSA25-275/3+1	10 454
	HLSA25-275/3+1 S	10 460



HLSA25-275/4+0 (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA25 in configurations 1+1, 3+1 and HLSA25G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL I and LPL II.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type 2 and 3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

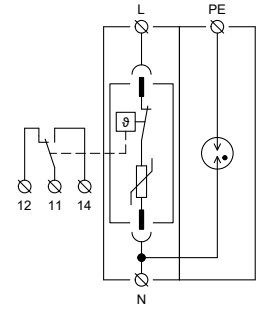
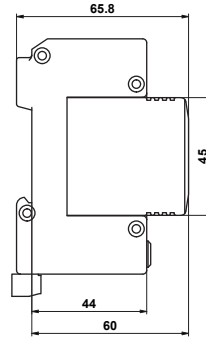
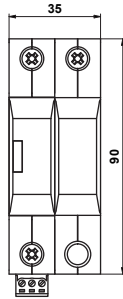
Type	HLSA25-275/4+0, HLSA25-275/4+0 S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S	
Number of poles	4	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	25 kA
Charge	Q	12.5 As
Specific energy for class I test	W/R	156 kJ/Ω
Total discharge current (10/350) L1+L2+L3+N->PE	I_{Total}	100 kA
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	200 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.2 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	250 A gL/gG	
Maximal back-up fuse („V“ connection)	125 A gL/gG	
Residual current	I_{PE}	≤ 300 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	80 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	2.5 ÷ 25 mm ²	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HLSA25-275/4+0	10 455
	HLSA25-275/4+0 S	10 461



HLSA12,5-275 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

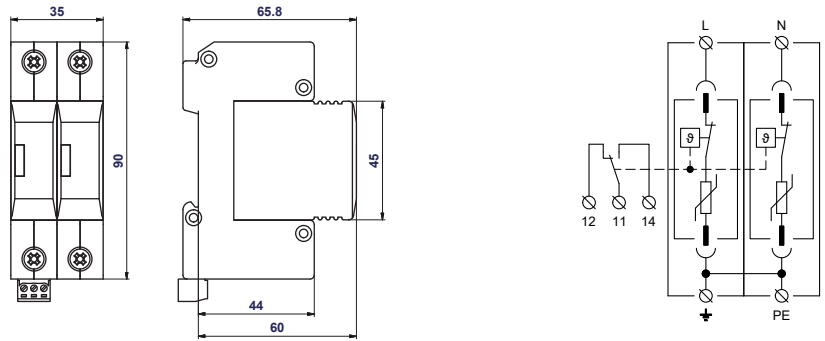
Type		HLSA12,5-275 M, HLSA12,5-275 M S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN
Number of poles		1
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12.5 kA
Charge	Q	6.25 As
Specific energy for class I test	W/R	39 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 700 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Installation		On DIN rail 35 mm
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		16 086
Article number	HLSA12,5-275 M	16 080
	HLSA12,5-275 M S	16 090



HLSA12,5-275/1+1 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

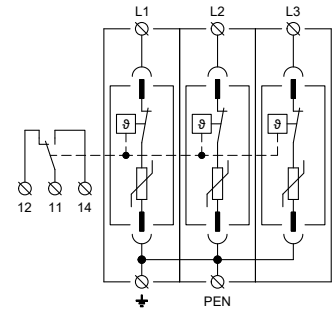
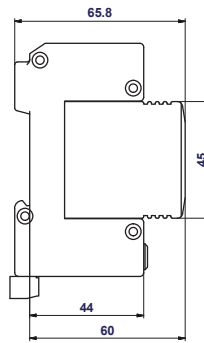
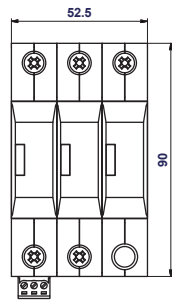
Type	HLSA12,5-275/1+1 M, HLSA12,5-275/1+1 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S, TT	
Number of poles	2	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12.5 kA
Charge	Q	6.25 As
Specific energy for class I test	W/R	39 kJ/Ω
Total discharge current L+N->PE	I_{Total}	50 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n (L/N)	U_p	< 1.25 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Installation		On DIN rail 35 mm
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		16 086
Article number	HLSA12,5-275/1+1 M	16 081
	HLSA12,5-275/1+1 M S	16 091



HLSA12,5-275/2+0 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

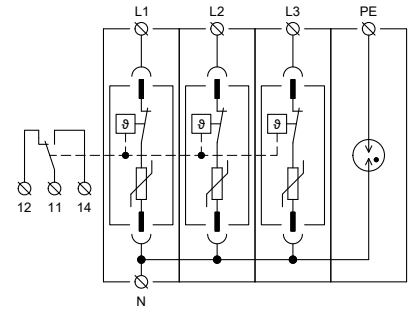
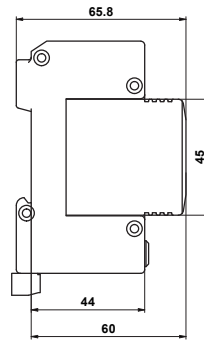
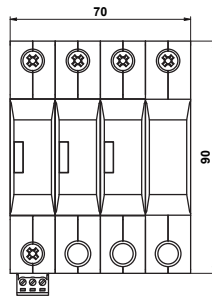
Type	HLSA12,5-275/2+0 M, HLSA12,5-275/2+0 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S	
Number of poles	2	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12.5 kA
Charge	Q	6.25 As
Specific energy for class I test	W/R	39 kJ/Ω
Total discharge current (10/350) L+N->PE	I_{Total}	25 kA
Total discharge current (8/20) L+N->PE	I_{Total}	100 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	160 A gL/gG	
Residual current	I_{PE}	≤ 700 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	1.5 ÷ 16 mm ²	
Installation	On DIN rail 35 mm	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number of spare module	16 086	
Article number	HLSA12,5-275/2+0 M	16 082
	HLSA12,5-275/2+0 M S	16 092



HLSA12,5-275/3+0 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

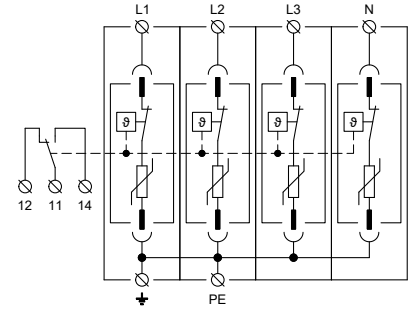
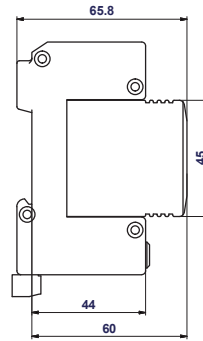
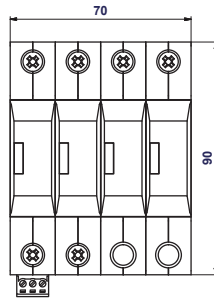
Type	HLSA12,5-275/3+0 M, HLSA12,5-275/3+0 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T1, T2, T3
System		TN-C
Number of poles		3
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12.5 kA
Charge	Q	6.25 As
Specific energy for class I test	W/R	39 kJ/Ω
Total discharge current (10/350) L1+L2+L3->PEN	I_{Total}	37.5 kA
Total discharge current (8/20) L1+L2+L3->PEN	I_{Total}	150 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 300 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	θ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Installation		On DIN rail 35 mm
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		16 086
Article number	HLSA12,5-275/3+0 M	16 083
	HLSA12,5-275/3+0 M S	16 093



HLSA12,5-275/3+1 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

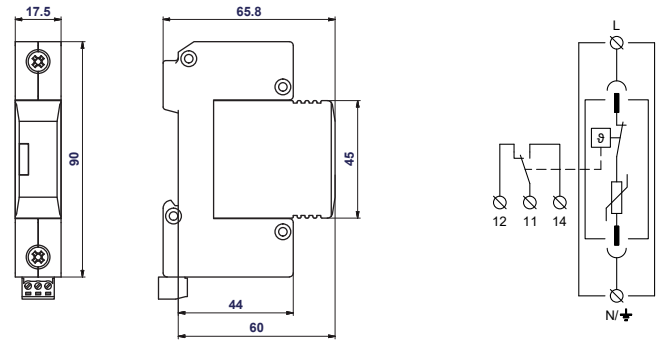
Type	HLSA12,5-275/3+1 M, HLSA12,5-275/3+1 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S, TT	
Number of poles	4	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12,5 kA (L/N) 50 kA (N/PE)
Charge	Q	6.25 As (L/N) 25 As (N/PE)
Specific energy for class I test	W/R	39 kJ/Ω (L/N) 625 kJ/Ω (N/PE)
Total discharge current L1+L2+L3+N->PE	I_{Total}	50 kA (10/350) 100 kA (8/20)
Nominal discharge current for class II test (8/20)	I_n	25 kA (L/N) 50 kA (N/PE)
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV (L/N) < 1.5 kV (N/PE)
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse	160 A gL/gG	
Residual current	I_{PE}	≤ 5 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	1.5 ÷ 16 mm ²	
Installation	On DIN rail 35 mm	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number of spare module	16 086	
Article number	HLSA12,5-275/3+1 M	16 084
	HLSA12,5-275/3+1 M S	16 094



HLSA12,5-275/4+0 M (S)

- Lightning impulse current and surge arresters type T1+T2+T3.
- The products consist of varistors with big discharge ability.
- HLSA12,5 in configurations 1+1, 3+1 and HLSA12,5G are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Suitable for objects with considerable levels of protection LPL III and LPL IV.
- Installed at the boundaries of LPZ 0 – LPZ 1 and higher zones, closest to where overhead line enters the building i.e. in the main distribution boards.
- In case of the installation of a type T1+T2+T3 in the main switchboard, it is also necessary to install type T2 and T3 in any additional distribution boards in the electrical installation.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

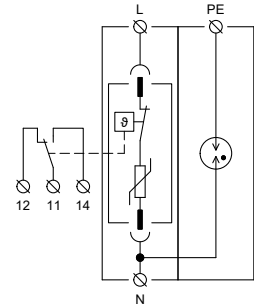
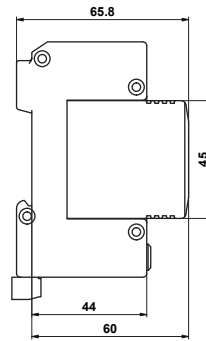
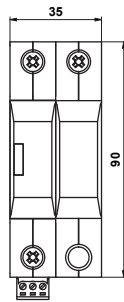
Type	HLSA12,5-275/4+0 M, HLSA12,5-275/4+0 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T1, T2, T3	
System	TN-S	
Number of poles	4	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12.5 kA
Charge	Q	6.25 As
Specific energy for class I test	W/R	39 kJ/Ω
Total discharge current (10/350) L1+L2+L3+N->PE	I_{Total}	50 kA
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	200 kA
Nominal discharge current for class II test (8/20)	I_n	25 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse	160 A gL/gG	
Residual current	I_{PE}	≤ 300 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T1	S	6 mm ² (L, N) 16 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	1.5 ÷ 16 mm ²	
Installation	On DIN rail 35 mm	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number of spare module	16 086	
Article number	HLSA12,5-275/4+0 M	16 085
	HLSA12,5-275/4+0 M S	16 095



HSA-275 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.
- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSA-275 M, HSA-275 M S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
System		TN
Number of poles		1
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Voltage protection level at I_n	U_p	< 1.25 kV
Voltage protection level at U_{OC}	U_p	< 0.85 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	$\leq 450 \mu A$
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		27 086
Article number	HSA-275 M	27 080
	HSA-275 M S	27 090

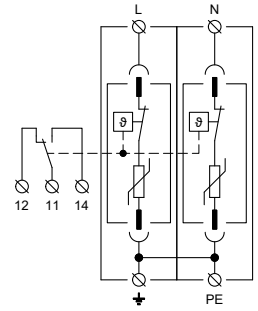
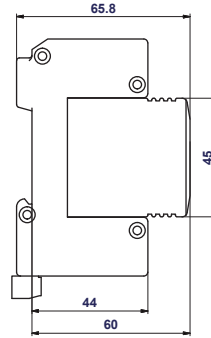
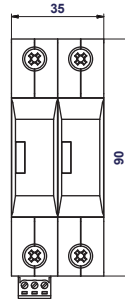


HSA-275/1+1 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.

- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type	HSA-275/1+1 M, HSA-275/1+1 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)	T2, T3	
System	TN-S, TT	
Number of poles	2	
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Total discharge current (8/20) L+N->PE	I_{Total}	50 kA
Voltage protection level at I_n (L/N)	U_p	< 1.25 kV
Voltage protection level at I_n (L/PE)	U_p	< 1.5 kV
Voltage protection level at I_n (N/PE)	U_p	< 1.4 kV
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	20 kA
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse	160 A gL/gG	
Residual current	I_{PE}	$\leq 5 \mu A$
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material	Polyamid PA6, UL94 V-0	
Degree of protection	IP20	
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)	1.5 ÷ 16 mm ²	
Operating position	Any	
Importance of local signaling	OK – clear target, FAULT – red target	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)	AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number of spare module	27 086	
Article number	HSA-275/1+1 M	27 081
	HSA-275/1+1 M S	27 091

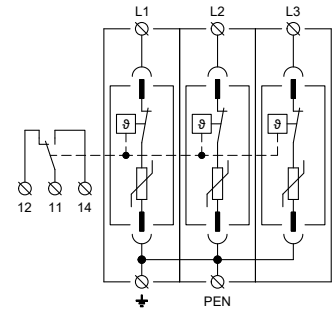
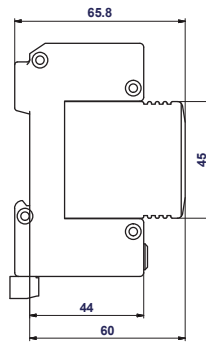
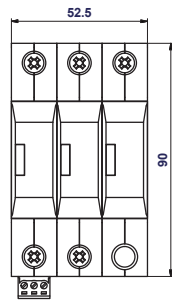


HSA-275/2+0 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.

- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type	HSA-275/2+0 M, HSA-275/2+0 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
System		TN-S
Number of poles		2
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Total discharge current (8/20) L+N->PE	I_{Total}	100 kA
Voltage protection level at I_n	U_p	< 1.25 kV
Voltage protection level at U_{OC}	U_p	< 0.85 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 600 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		27 086
Article number	HSA-275/2+0 M	27 082
	HSA-275/2+0 M S	27 092

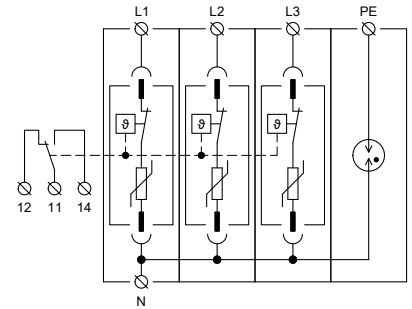
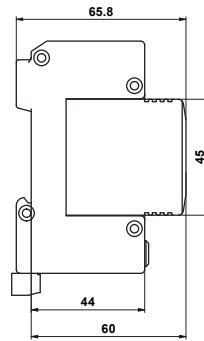
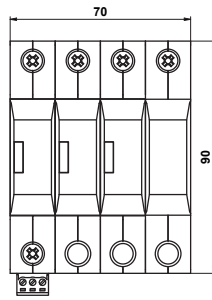


HSA-275/3+0 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.

- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type	HSA-275/3+0 M, HSA-275/3+0 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
System		TN-C
Number of poles		3
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Total discharge current (8/20) L1+L2+L3->PEN	I_{Total}	150 kA
Voltage protection level at I_n	U_p	< 1.25 kV
Voltage protection level at U_{OC}	U_p	< 0.85 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 200 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		27 086
Article number	HSA-275/3+0 M	27 083
	HSA-275/3+0 M S	27 093

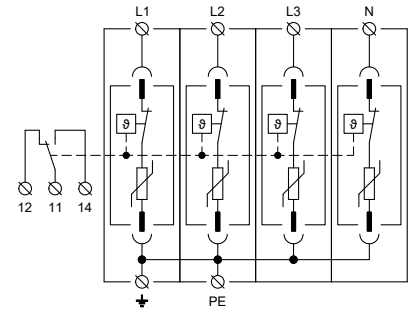
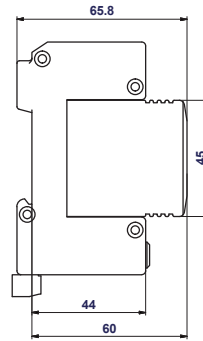
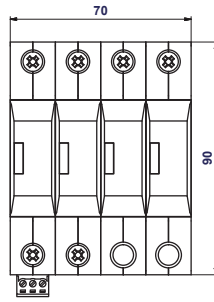


HSA-275/3+1 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.

- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type	HSA-275/3+1 M, HSA-275/3+1 M S	
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
System		TN-S, TT
Number of poles		4
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	50 kA
Voltage protection level at I_n (L/N)	U_p	< 1.25 kV
Voltage protection level at I_n (L/PE)	U_p	< 1.5 kV
Voltage protection level at I_n (N/PE)	U_p	< 1.4 kV
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	20 kA
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. t o HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		27 086
Article number	HSA-275/3+1 M	27 084
	HSA-275/3+1 M S	27 094

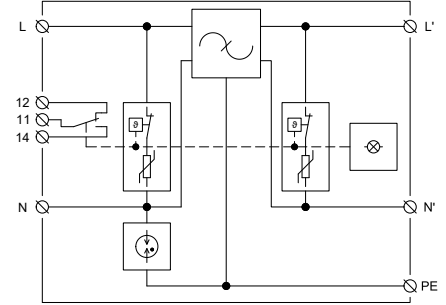
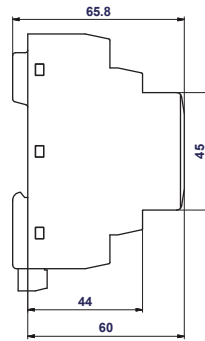
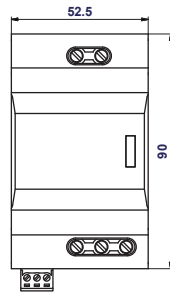


HSA-275/4+0 M (S)

- Surge arresters type T2+T3 ensure the equipotential bonding and reduce switching, induced and residual overvoltage in LV power supply systems.
- The products consist of varistors with big discharge ability.
- Configurations 1+1 and 3+1 are additionally combined with a gas discharge tube which ensures zero leakage current through the PE conductor.
- Installed at the boundaries of LPZ 1 – LPZ 3 into subsidiary switchboards and control panels.

- If the product contains two PE (or PEN) terminals, it must not be used as a PE (PEN) bridge.
- **M** indication specifies a type of construction with removable module. **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

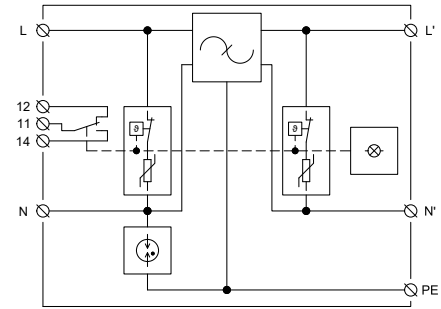
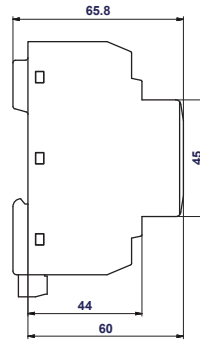
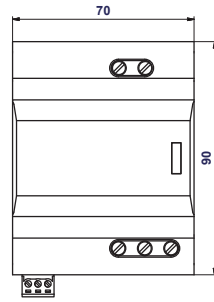
Type		HSA-275/4+0 M, HSA-275/4+0 M S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
System		TN-S
Number of poles		4
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Maximum discharge current (8/20)	I_{max}	50 kA
Nominal discharge current for class II test (8/20)	I_n	20 kA
Open circuit voltage of the combination wave generator	U_{OC}	6 kV
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	200 kA
Voltage protection level at I_n	U_p	< 1.25 kV
Voltage protection level at U_{OC}	U_p	< 0.85 kV
Temporary overvoltage test (TOV) for $t_T = 5$ s	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min	U_T	440 V
Maximal back-up fuse		160 A gL/gG
Residual current	I_{PE}	≤ 200 μA
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	60 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-534:2016 (doesn't apply to „V“ connection) for T2	S	2.5 mm ² (L, N) 6 mm ² (PE, PEN)
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²
Operating position		Any
Importance of local signaling		OK – clear target, FAULT – red target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A
Article number of spare module		27 086
Article number	HSA-275/4+0 M	27 085
	HSA-275/4+0 M S	27 095



HSAF10 (S), HSAF16 (S)

- Two-stage surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF* S from the power grid during the MOV's overheating and thus prevents damage to the HSAF* S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF* S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSAF10, HSAF10 S	HSAF16, HSAF16 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3	
System		TN-C-S, TN-S	
Number of poles		2	
Rated operating AC voltage	U_N	230 V	
Maximum continuous operating voltage AC	U_C	275 V	
Rated load current	I_L	10 A	16 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 0.75 kV	
Voltage protection level at U_{OC} (L/PE)	U_p	< 1 kV	
Voltage protection level at U_{OC} (N/PE)	U_p	< 1.5 kV	
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA	
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA	
Total discharge current (8/20) L+N->PE	I_{Total}	6 kA	
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB	
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB	
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Power dissipation at 20 °C	P_z	< 2.2 W	< 3.5 W
Maximal back-up fuse		10 A gL/gG	16 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$	
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 55 °C	
Humidity range	RH	5 ÷ 95 %	
Recommended cross-section of connected conductors	S	1.5 mm ²	
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²	
Operating position		Any	
Importance of local signaling		OK – red light off, FAULT – red light on	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HSAF*	30 160	30 161
	HSAF* S	30 170	30 171

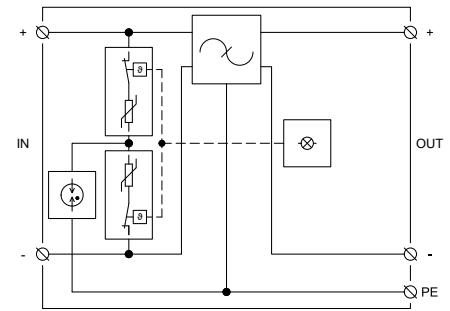
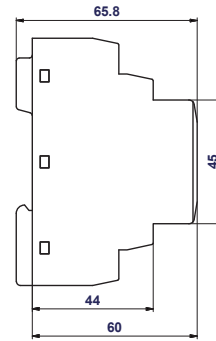
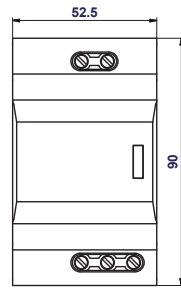


HSAF25 (S), HSAF32 (S)

- Two-stage surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF* S from the power grid during the MOV's overheating and thus prevents damage to the HSAF* S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).

- In front of HSAF* S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

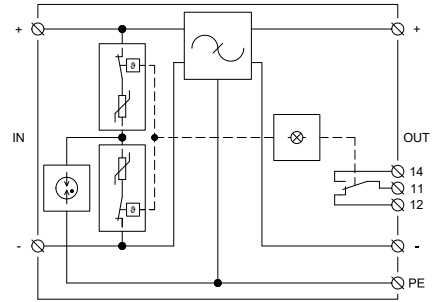
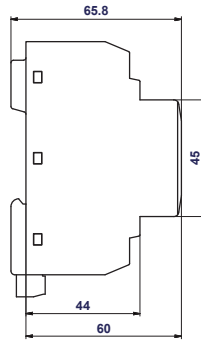
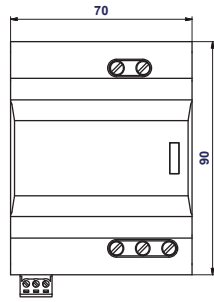
Type		HSAF25, HSAF25 S	HSAF32, HSAF32 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3	
System		TN-C-S, TN-S	
Number of poles		2	
Rated operating AC voltage	U_N	230 V	
Maximum continuous operating voltage AC	U_C	275 V	
Rated load current	I_L	25 A	32 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 0.8 kV	
Voltage protection level at U_{OC} (L/PE)	U_p	< 1.5 kV	
Voltage protection level at U_{OC} (N/PE)	U_p	< 1.2 kV	
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA	
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA	
Total discharge current (8/20) L+N->PE	I_{Total}	6 kA	
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB	
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB	
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Power dissipation at 20 °C	P_z	< 3 W	< 4 W
Maximal back-up fuse		25 A gL/gG	32 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$	
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 55 °C	
Humidity range	RH	5 ÷ 95 %	
Recommended cross-section of connected conductors	S	4 mm ²	6 mm ²
Clamp fastening range (stranded conductor)		2.5 ÷ 10 mm ²	
Operating position		Any	
Importance of local signaling		OK – red light off, FAULT – red light on	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HSAF*	30 196	30 198
	HSAF* S	30 197	30 199



HSAF10/*VDC

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in DC power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF*VDC S from the power grid during the MOV's overheating and thus prevents damage to the HSAF*VDC S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF*VDC S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSAF10/ 6VDC	HSAF10/ 12VDC	HSAF10/ 24VDC	HSAF10/ 48VDC	HSAF10/ 60VDC	HSAF10/ 120VDC	HSAF10/ 220VDC
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3						
System		DC						
Rated operating DC voltage	U_N	6 V	12 V	24 V	48 V	60 V	120 V	220 V
Maximum continuous operating voltage DC	U_C	7.2 V	14.4 V	28.8 V	57.6 V	72 V	144 V	264 V
Rated load current	I_L	10 A						
Open circuit voltage of the combination wave generator (+/-, ±/PE)	U_{OC}	4 kV					6 kV	
Voltage protection level at U_{OC} (+/-)	U_p	< 0.35 kV		< 0.4 kV	< 0.5 kV	< 0.55 kV	< 0.9 kV	< 1.3 kV
Voltage protection level at U_{OC} (±/PE)	U_p	< 0.3 kV				< 0.4 kV	< 0.6 kV	< 0.8 kV
Nominal discharge current for class II test (8/20) +/-, ±/PE	I_n	2 kA					3 kA	
Total discharge current (8/20) ±->PE	I_{Total}	4 kA					6 kA	
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB						
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB						
Power dissipation at 20 °C	P_z	< 2.2 W						
Maximal back-up fuse		10 A gL/gG						
Residual current	I_{PE}	$\leq 5 \mu A$						
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}						
Housing material		Polyamid PA6, UL94 V-0						
Degree of protection		IP20						
Operating temperature	ϑ	-40 ÷ 55 °C						
Humidity range	RH	5 ÷ 95 %						
Recommended cross-section of connected conductors	S	1.5 mm ²						
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²						
Operating position		Any						
Importance of local signaling		OK – red light off, FAULT – red light on						
Article number		30 149	30 150	30 157	30 158	30 159	30 162	30 163

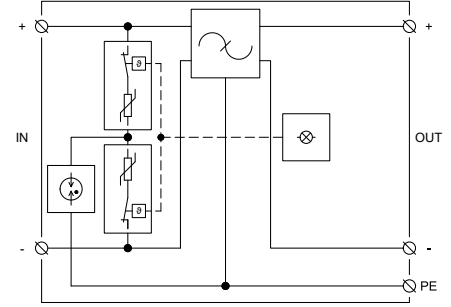
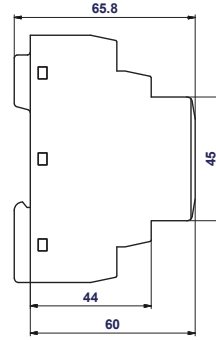
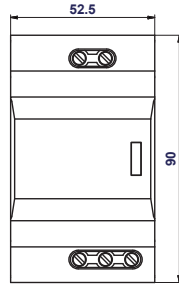


HSAF10/*VDC S

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in DC power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF*VDC S from the power grid during the MOV's overheating and thus prevents damage to the HSAF*VDC S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).

- In front of HSAF*VDC S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

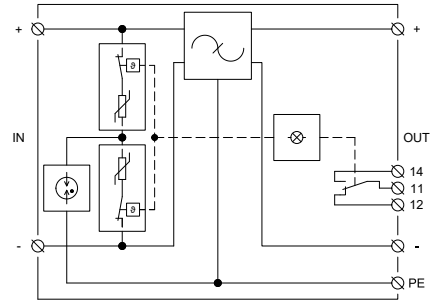
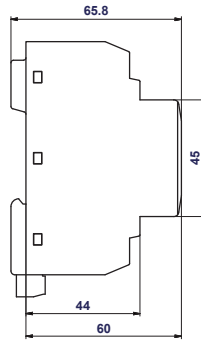
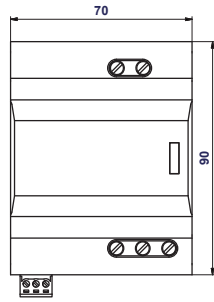
Type		HSAF10/ 6VDC S	HSAF10/ 12VDC S	HSAF10/ 24VDC S	HSAF10/ 48VDC S	HSAF10/ 60VDC S	HSAF10/ 120VDC S	HSAF10/ 220VDC S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3						
System		DC						
Rated operating DC voltage	U_N	6 V	12 V	24 V	48 V	60 V	120 V	220 V
Maximum continuous operating voltage DC	U_C	7.2 V	14.4 V	28.8 V	57.6 V	72 V	144 V	264 V
Rated load current	I_L	10 A						
Open circuit voltage of the combination wave generator (+/-, ±/PE)	U_{OC}	4 kV					6 kV	
Voltage protection level at U_{OC} (+/-)	U_p	< 0.35 kV	< 0.4 kV	< 0.5 kV	< 0.55 kV	< 0.9 kV	< 1.3 kV	
Voltage protection level at U_{OC} (±/PE)	U_p	< 0.3 kV				< 0.4 kV	< 0.6 kV	< 0.8 kV
Nominal discharge current for class II test (8/20) +/-, ±/PE	I_n	2 kA					3 kA	
Total discharge current (8/20) ±->PE	I_{Total}	4 kA					6 kA	
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB						
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB						
Power dissipation at 20 °C	P_z	< 2.2 W						
Maximal back-up fuse		10 A gL/gG						
Residual current	I_{PE}	$\leq 5 \mu A$						
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}						
Housing material		Polyamid PA6, UL94 V-0						
Degree of protection		IP20						
Operating temperature	ϑ	-40 ÷ 55 °C						
Humidity range	RH	5 ÷ 95 %						
Recommended cross-section of connected conductors	S	1.5 mm ²						
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²						
Operating position		Any						
Importance of local signaling		OK – red light off, FAULT – red light on						
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A						
Article number		30 267	30 268	30 269	30 270	30 271	30 272	30 273



HSAF16/*VDC

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in DC power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF*VDC S from the power grid during the MOV's overheating and thus prevents damage to the HSAF*VDC S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF*VDC S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSAF16/ 6VDC	HSAF16/ 12VDC	HSAF16/ 24VDC	HSAF16/ 48VDC	HSAF16/ 60VDC	HSAF16/ 120VDC	HSAF16/ 220VDC
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3						
System		DC						
Rated operating DC voltage	U_N	6 V	12 V	24 V	48 V	60 V	120 V	220 V
Maximum continuous operating voltage DC	U_C	7.2 V	14.4 V	28.8 V	57.6 V	72 V	144 V	264 V
Rated load current	I_L	16 A						
Open circuit voltage of the combination wave generator (+/-, ±/PE)	U_{OC}	4 kV					6 kV	
Voltage protection level at U_{OC} (+/-)	U_p	< 0.35 kV		< 0.4 kV	< 0.5 kV	< 0.55 kV	< 0.9 kV	< 1.3 kV
Voltage protection level at U_{OC} (±/PE)	U_p	< 0.3 kV				< 0.4 kV	< 0.6 kV	< 0.8 kV
Nominal discharge current for class II test (8/20) +/-, ±/PE	I_n	2 kA					3 kA	
Total discharge current (8/20) ±->PE	I_{Total}	4 kA					6 kA	
Asymmetrical attenuation of filter at f = 4 MHz		> 80 dB						
Asymmetrical attenuation of filter at f = 0.15 ÷ 30 MHz		> 40 dB						
Power dissipation at 20 °C	P_z	< 3.5 W						
Maximal back-up fuse		16 A gL/gG						
Residual current	I_{PE}	≤ 5 μA						
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}						
Housing material		Polyamid PA6, UL94 V-0						
Degree of protection		IP20						
Operating temperature	ϑ	-40 ÷ 55 °C						
Humidity range	RH	5 ÷ 95 %						
Recommended cross-section of connected conductors	S	2.5 mm ²						
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²						
Operating position		Any						
Importance of local signaling		OK – red light off, FAULT – red light on						
Article number		30 142	30 143	30 144	30 145	30 146	30 147	30 148

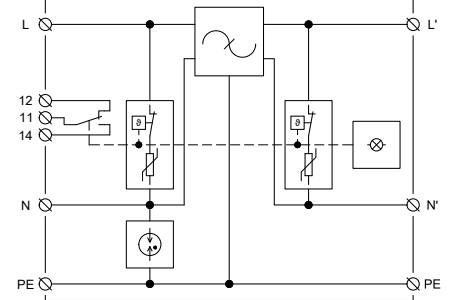
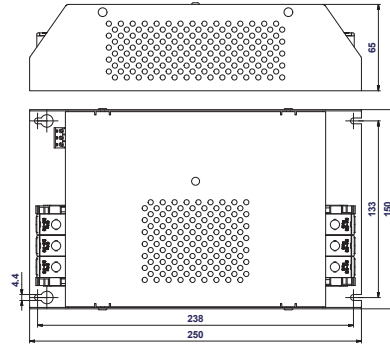
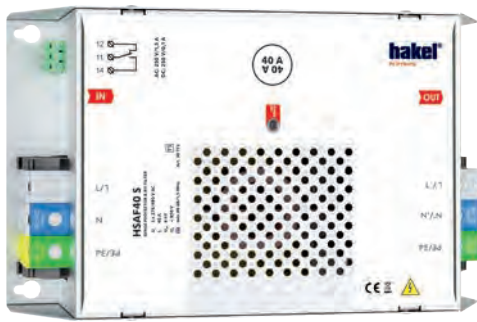


HSAF16/*VDC S

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in DC power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of HSAF*VDC S from the power grid during the MOV's overheating and thus prevents damage to the HSAF*VDC S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).

- In front of HSAF*VDC S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

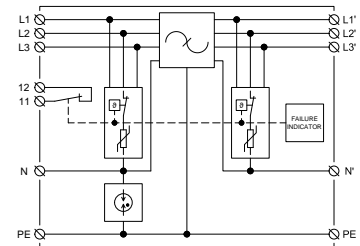
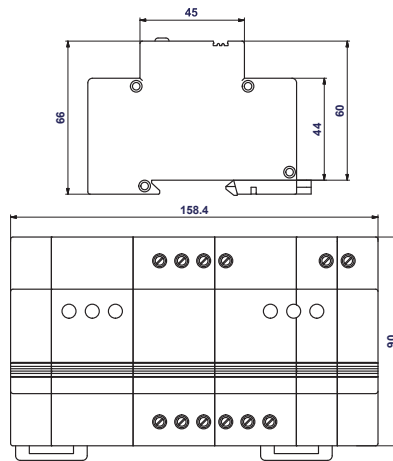
Type		HSAF16/ 6VDC S	HSAF16/ 12VDC S	HSAF16/ 24VDC S	HSAF16/ 48VDC S	HSAF16/ 60VDC S	HSAF16/ 120VDC S	HSAF16/ 220VDC S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3						
System		DC						
Rated operating DC voltage	U_N	6 V	12 V	24 V	48 V	60 V	120 V	220 V
Maximum continuous operating voltage DC	U_C	7.2 V	14.4 V	28.8 V	57.6 V	72 V	144 V	264 V
Rated load current	I_L	16 A						
Open circuit voltage of the combination wave generator (+/-, ±/PE)	U_{OC}	4 kV					6 kV	
Voltage protection level at U_{OC} (+/-)	U_p	< 0.35 kV	< 0.4 kV	< 0.5 kV	< 0.55 kV	< 0.9 kV	< 1.3 kV	
Voltage protection level at U_{OC} (±/PE)	U_p	< 0.3 kV				< 0.4 kV	< 0.6 kV	< 0.8 kV
Nominal discharge current for class II test (8/20) +/-, ±/PE	I_n	2 kA					3 kA	
Total discharge current (8/20) ±->PE	I_{Total}	4 kA					6 kA	
Asymmetrical attenuation of filter at f = 4 MHz		> 80 dB						
Asymmetrical attenuation of filter at f = 0.15 ÷ 30 MHz		> 40 dB						
Power dissipation at 20 °C	P_z	< 3.5 W						
Maximal back-up fuse		16 A gL/gG						
Residual current	I_{PE}	≤ 5 µA						
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}						
Housing material		Polyamid PA6, UL94 V-0						
Degree of protection		IP20						
Operating temperature	ϑ	-40 ÷ 55 °C						
Humidity range	RH	5 ÷ 95 %						
Recommended cross-section of connected conductors	S	2.5 mm ²						
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²						
Operating position		Any						
Importance of local signaling		OK – red light off, FAULT – red light on						
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A						
Article number		30 260	30 261	30 262	30 263	30 264	30 265	30 266



HSAF40 S, 50 S, 63 S, 80 S, 125 S, 160 S

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in LV power supply systems.
- Contains an improved thermal fuse, which ensures timely disconnection of HSAF* S and HSAF3*S from the power grid during the MOV's overheating and thus prevents damage to the HSAF* S and HSAF3*S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF* S and HSAF3*S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- Mounted on the main board of a switchboard using four screws.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

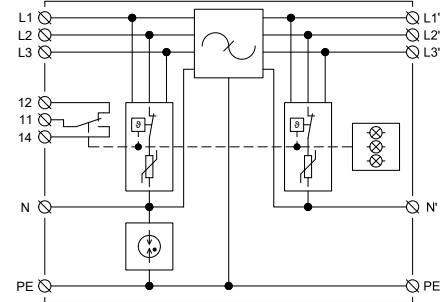
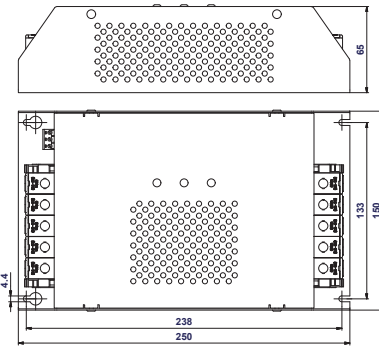
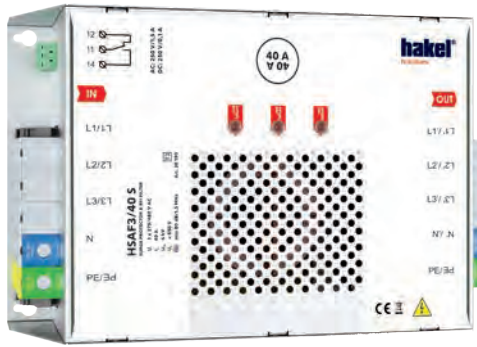
Type		HSAF40 S	HSAF50 S	HSAF63 S	HSAF80 S	HSAF125 S	HSAF160 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3					
System		TN-C-S, TN-S					
Number of poles		2					
Rated operating AC voltage	U_N	230 V					
Maximum continuous operating voltage AC	U_C	275 V					
Rated load current	I_L	40 A	50 A	63 A	80 A	125 A	160 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)					
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV					
Voltage protection level at U_{OC} (L/PE)	U_p	< 1.5 kV					
Voltage protection level at U_{OC} (N/PE)	U_p	< 1.2 kV					
Nominal discharge current for class II test (8/20)	I_n	3 kA (L/N, L/PE), 5 kA (N/PE)					
Total discharge current (8/20) L+N->PE	I_{Total}	6 kA					
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB					
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB					
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V					
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V					
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V					
Power dissipation at 20 °C	Pz	< 4 W	< 7 W	< 9 W	< 12 W	< 20 W	< 20 W
Maximal back-up fuse		40 A gL/gG	50 A gL/gG	63 A gL/gG	80 A gL/gG	125 A gL/gG	160 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$					
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}					
Housing material		Steel plate 1 mm					
Degree of protection		IP20					
Operating temperature	ϑ	-40 ÷ 55 °C					
Humidity range	RH	5 ÷ 95 %					
Recommended cross-section of connected conductors	S	10 mm ²	16 mm ²	25 mm ²	35 mm ²	50 mm ²	
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²			1.5 ÷ 35 mm ²		
Installation		Using the M4 screws on the chassis					
Operating position		Any					
Importance of local signaling		OK – red light off, FAULT – red light on					
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A					
Article number		30 172	30 173	30 174	30 175	30 176	30 177



PI-3k16, PI-3k16/320

- Two-stage surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Contain an improved thermal fuse, which ensures timely disconnection of PI-3k16 from the power grid during the MOV's overheating and thus prevents damage to the PI-3k16.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of PI-3k16 must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

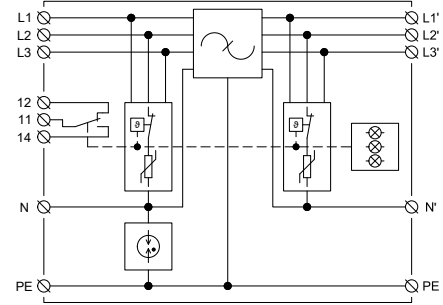
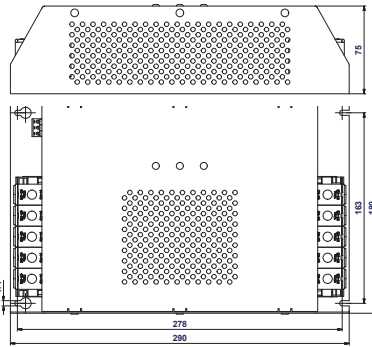
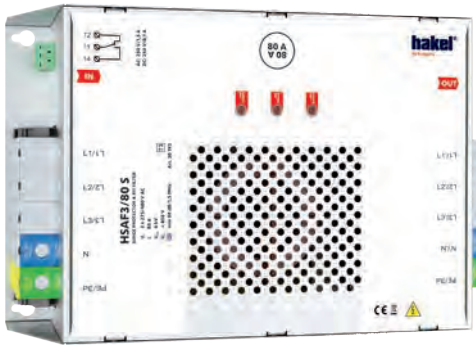
Type		PI-3k16	PI-3k16/320
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T3
System			TN-C-S, TN-S
Number of poles			4
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C	275 V	320 V
Rated load current	I_L		16 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV	< 1.2 kV
Voltage protection level at U_{OC} (L/PE)	U_p	< 1.5 kV	< 1.8 kV
Voltage protection level at U_{OC} (N/PE)	U_p		< 1.2 kV
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n		3 kA
Nominal discharge current for class II test (8/20) N/PE	I_n		5 kA
Total discharge current (8/20) L+N->PE	I_{Total}		6 kA
Asymmetrical attenuation of filter at $f = 4$ MHz			> 80 dB
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz			> 40 dB
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T		337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T		440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T		1 200 V
Power dissipation at 20 °C	P_z		< 7.5 W
Maximal back-up fuse			16 A gL/gG
Residual current	I_{PE}		$\leq 5 \mu A$
Short-circuit current rating at maximum back-up fuse	I_{SCCR}		6 kA _{rms}
Follow current interrupt rating (N/PE)	I_{fi}		0.1 kA _{rms}
Housing material			Polyamid PA6, UL94 V-0
Degree of protection			IP20
Operating temperature	ϑ		-40 ÷ 55 °C
Humidity range	RH		5 ÷ 95 %
Recommended cross-section of connected conductors	S		2.5 mm ²
Clamp fastening range (stranded conductor)			0.5 ÷ 4 mm ²
Operating position			Any
Importance of local signaling			OK – red retracted target, FAULT – red extended target
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)			AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Article number		30 300	30 310



HSAF3/40 S, HSAF3/50 S, HSAF3/63 S

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in LV power supply systems.
- Contains an improved thermal fuse, which ensures timely disconnection of HSAF* S and HSAF3*S from the power grid during the MOV's overheating and thus prevents damage to the HSAF* S and HSAF3*S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF* S and HSAF3*S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- Mounted on the main board of a switchboard using four screws.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

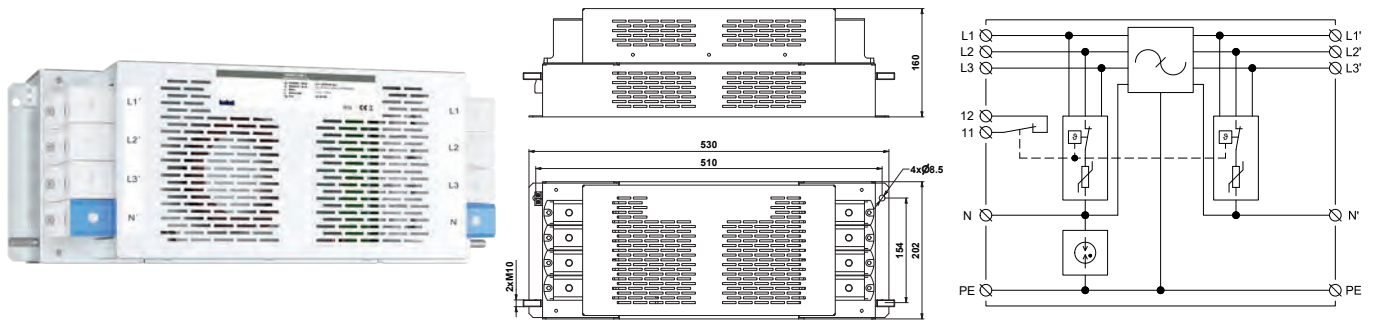
Type		HSAF3/40 S	HSAF3/50 S	HSAF3/63 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T3	
System			TN-C-S, TN-S	
Number of poles			4	
Rated operating AC voltage	U_N		230 V	
Maximum continuous operating voltage AC	U_C		275 V	
Rated load current	I_L	40 A	50 A	63 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)		
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV		
Voltage protection level at U_{OC} (L/PE)	U_p	< 1.5 kV		
Voltage protection level at U_{OC} (N/PE)	U_p	< 1.2 kV		
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA		
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA		
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	12 kA		
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB		
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB		
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V		
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V		
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V		
Power dissipation at 20 °C	P_z	< 8 W	< 9 W	< 12 W
Maximal back-up fuse		40 A gL/gG	50 A gL/gG	63 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$		
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA_{rms}		
Housing material		Steel plate 1 mm		
Degree of protection		IP20		
Operating temperature	ϑ	-40 ÷ 55 °C		
Humidity range	RH	5 ÷ 95 %		
Recommended cross-section of connected conductors	S	10 mm ²		16 mm ²
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²		
Installation		Using the M4 screws on the chassis		
Operating position		Any		
Importance of local signaling		OK – red light off, FAULT – red light on		
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A		
Article number		30 190	30 191	30 192



HSAF3/80 S, HSAF3/125 S, HSAF3/160 S

- Two-port surge arresters type T3 with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in LV power supply systems.
- Contains an improved thermal fuse, which ensures timely disconnection of HSAF* S and HSAF3*S from the power grid during the MOV's overheating and thus prevents damage to the HSAF* S and HSAF3*S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAF* S and HSAF3*S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- Mounted on the main board of a switchboard using four screws.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

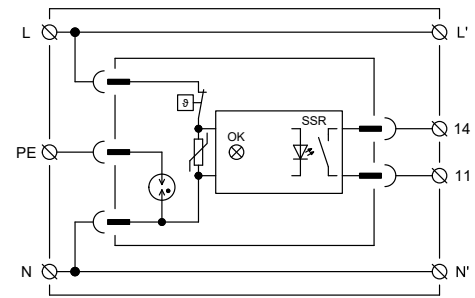
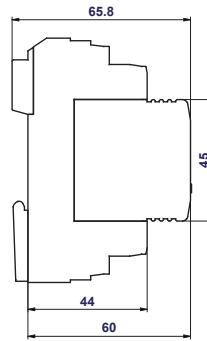
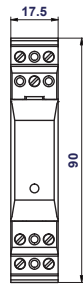
Type		HSAF3/80 S	HSAF3/125 S	HSAF3/160 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T3	
System			TN-C-S, TN-S	
Number of poles			4	
Rated operating AC voltage	U_N		230 V	
Maximum continuous operating voltage AC	U_C		275 V	
Rated load current	I_L	80 A	125 A	160 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)		
Voltage protection level at U_{OC} (L/N)	U_p	< 0.85 kV		
Voltage protection level at U_{OC} (L/PE)	U_p	< 1.5 kV		
Voltage protection level at U_{OC} (N/PE)	U_p	< 1.2 kV		
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA		
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA		
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	12 kA		
Asymmetrical attenuation of filter at $f = 4$ MHz		> 80 dB		
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 40 dB		
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V		
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V		
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V		
Power dissipation at 20 °C	Pz	< 15 W	< 20 W	< 25 W
Maximal back-up fuse		80 A gL/gG	125 A gL/gG	160 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$		
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}		
Housing material		Steel plate 1 mm		
Degree of protection		IP20		
Operating temperature	ϑ	-40 ÷ 55 °C		
Humidity range	RH	5 ÷ 95 %		
Recommended cross-section of connected conductors	S	25 mm ²	35 mm ²	50 mm ²
Clamp fastening range (stranded conductor)		1.5 ÷ 35 mm ²		
Installation		Using the M4 screws on the chassis		
Operating position		Any		
Importance of local signaling		OK – red light off, FAULT – red light on		
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A		
Article number		30 193	30 194	30 195



HSAF3/250 S, HSAF3/400 S

- Three-phase, two-stage surge arresters type T2+T3 equipped with high-frequency filters for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Remote monitoring is solved on the basis of a potential-free switching contact.
- Any installation position without affecting function and parameters.
- Produced in basic version for mounting straight onto the switchboard's construction by screws M8.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; EN 55017:2011 / CISPR 17:2011
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSAF3/250 S	HSAF3/400 S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T2, T3
System			TN-C-S, TN-S
Number of poles			4
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		320 V
Rated load current	I_L	250 A	400 A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 1.25 kV	
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	20 kA	
Nominal discharge current for class II test (8/20) N/PE	I_n	50 kA	
Maximum discharge current (8/20)	I_{max}	40 kA	
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	50 kA	
Total discharge current (8/20) L1+L2+L3+N->PE	I_{Total}	50 kA	
Asymmetrical attenuation of filter at $f = 1.5$ MHz		> 70 dB	
Asymmetrical attenuation of filter at $f = 0.15 \div 30$ MHz		> 30 dB	
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Power dissipation at 20 °C	P_z	< 70 W	< 125 W
Maximal back-up fuse		250 A gL/gG	400 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Steel plate 0.8 mm	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 55 °C	
Humidity range	RH	5 ÷ 95 %	
Recommended cross-section of connected conductors	S	120 mm ²	240 mm ²
Clamp fastening range (stranded conductor)		35 ÷ 240 mm ²	
Installation		Using the M8 screws on the chassis	
Operating position		Any	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 0.5 A, DC: 250 V / 0.1 A	
Article number		30 309	30 308

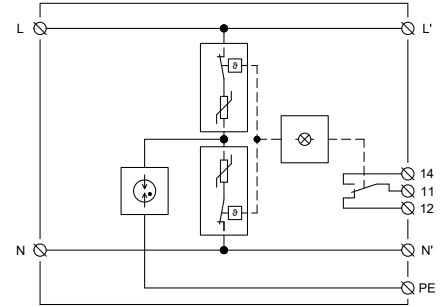
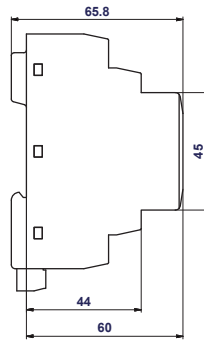
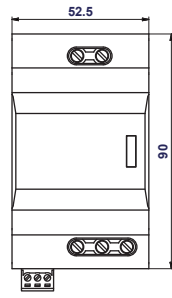


HSAD-S M S, HSAD-P M S

- Surge arresters type T3 for serial (HSAD-S M S) or parallel (HSAD-P M S) connection.
- Intended for protection of one-phase electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAD-S M S/HSAD-P M S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.

- Compact dimensions with a constructional modular width of 1 TE.
- A type of construction with a removable module.
- S indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

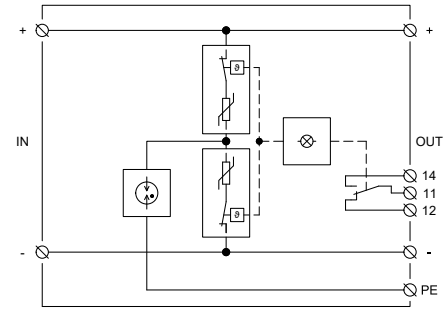
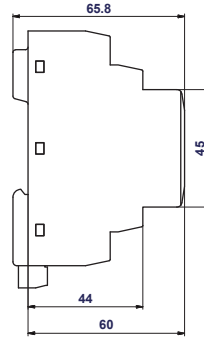
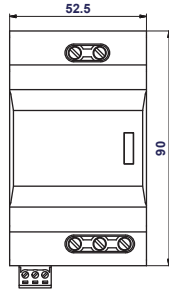
Type		HSAD-S M S	HSAD-P M S
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)			T3
System			TN-C-S, TN-S
Number of poles			2
Rated operating AC voltage	U_N		230 V
Maximum continuous operating voltage AC	U_C		275 V
Rated load current	I_L	10 A	N/A
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 1 kV	
Voltage protection level at U_{OC} (L/PE, N/PE)	U_p	< 1.5 kV	
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA	
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA	
Total discharge current (8/20) L+N->PE	I_{Total}	6 kA	
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Maximal back-up fuse		10 A gL/gG	
Residual current	I_{PE}	$\leq 5 \mu A$	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	$-40 \div 55$ °C	
Humidity range	RH	$5 \div 95$ %	
Recommended cross-section of connected conductors	S	1.5 mm ²	
Clamp fastening range (stranded conductor)		0.2 ÷ 2.5 mm ²	
Operating position		Any	
Importance of local signaling		OK – green light on, FAULT – green light off	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number of spare module		30 390	
Article number		30 370	30 380



HSAD16 (S), HSAD16/110VAC (S)

- Two-port surge arresters type T3 for serial connection.
- Intended for protection of one-phase electronic appliances against the effects of switching, induced and residual overvoltage generated in LV power supply systems.
- Contains an improved thermal fuse, which ensures timely disconnection of HSAD* S from the power grid during the MOV's overheating and thus prevents damage to the HSAD* S.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close to the device to be protected as possible (no further than 5 m).
- In front of HSAD* S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSAD16 (S)	HSAD16/110VAC (S)
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3	
System		TN-C-S, TN-S	
Number of poles		2	
Rated operating AC voltage	U_N	230 V	110 V
Maximum continuous operating voltage AC	U_C	275 V	132 V
Rated load current	I_L	16 A	
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)	
Voltage protection level at U_{OC} (L/N)	U_p	< 0.95 kV	< 0.6 kV
Voltage protection level at U_{OC} (L/PE, N/PE)	U_p	< 1.4 kV	< 0.7 kV
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA	
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA	
Total discharge current (8/20) L+N->PE	I_{Total}	6 kA	
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V	160 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V	
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V	
Maximal back-up fuse		16 A gL/gG	
Residual current	I_{PE}	$\leq 5 \mu A$	
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}	
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}	
Housing material		Polyamid PA6, UL94 V-0	
Degree of protection		IP20	
Operating temperature	ϑ	-40 ÷ 55 °C	
Humidity range	RH	5 ÷ 95 %	
Recommended cross-section of connected conductors	S	2.5 mm ²	
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²	
Operating position		Any	
Importance of local signaling		OK – red light off, FAULT – red light on	
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A	
Article number	HSAD16, HSAD16/110VAC	30 360	30 362
	HSAD16 S, HSAD16/110VAC S	30 361	30 363

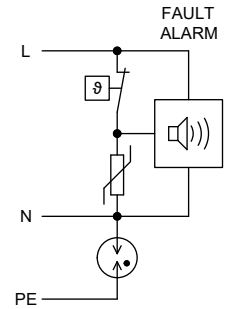
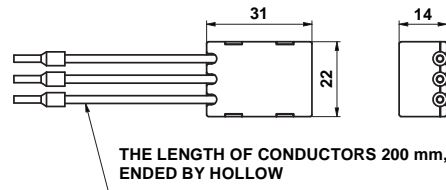


HSAD16/*VDC (S)

- Two-port surge arresters type T3 for serial connection.
- Intended for protection of electronic appliances against the effects of switching, induced and residual overvoltage in DC power supply systems.
- Contains an improved thermal fuse which ensures timely disconnection of the device from the power grid during overheating and thus prevents damage.
- Activation of the thermal fuse is signalled by an integral indicator light.

- Installed at the boundaries of LPZ 2 – LPZ 3, as close as possible to the protected device (no further than 5 m).
- In front of HSAD16/*VDC S must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **S** indication specifies a version with remote monitoring.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

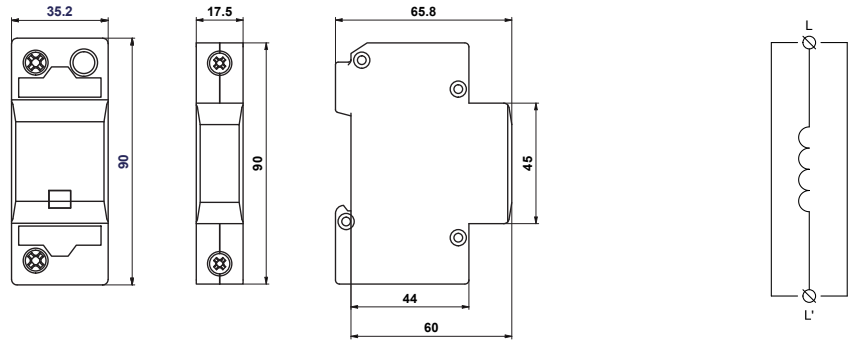
Type		HSAD16/ 6VDC (S)	HSAD16/ 12VDC (S)	HSAD16/ 24VDC (S)	HSAD16/ 48VDC (S)	HSAD16/ 60VDC (S)	HSAD16/ 120VDC (S)	HSAD16/ 220VDC (S)
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3						
System		DC						
Rated operating DC voltage	U_N	6 V	12 V	24 V	48 V	60 V	120 V	220 V
Maximum continuous operating voltage DC	U_C	7.2 V	14.4 V	28.8 V	57.6 V	72 V	144 V	264 V
Rated load current	I_L	16 A						
Open circuit voltage of the combination wave generator	U_{OC}	4 kV					6 kV	
Voltage protection level at U_{OC} (+/-)	U_p	< 0.2 kV		< 0.25 kV	< 0.3 kV	< 0.35 kV	< 0.5 kV	< 0.8 kV
Voltage protection level at U_{OC} (\pm /PE)	U_p	< 0.6 kV					< 0.8 kV	< 1.5 kV
Nominal discharge current for class II test (8/20)	I_n	2 kA					3 kA	
Total discharge current (8/20) \pm ->PE	I_{Total}	4 kA					6 kA	
Maximal back-up fuse		16 A						
Residual current	I_{PE}	$\leq 5 \mu A$						
Short-circuit current rating at maximum back-up fuse	I_{SCCR}	6 kA _{rms}						
Housing material		Polyamid PA6. UL94 V-0						
Degree of protection		IP20						
Operating temperature	ϑ	-40 ÷ 55 °C						
Humidity range	RH	5 ÷ 95 %						
Recommended cross-section of connected conductors	S	2.5 mm ²						
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm ²						
Operating position		Any						
Importance of local signaling		OK – red light off, FAULT – red light on						
Potential free signal contact (S) (recommended cross-section of remote monitoring max. 1 mm ²)		AC: 250 V / 1.5 A, DC: 250 V / 0.1 A						
Article number	HSAD16/*	30 250	30 251	30 252	30 253	30 254	30 255	30 256
	HSAD16/* S	30 283	30 284	30 285	30 286	30 287	30 288	30 289



HSA A-1P

- Surge arresters type T3 intended for use in installation and floor boxes and cable trays.
- Additional protection of socket circuits, which are treated with surge protection and high-frequency filters (HSAF, HSAF3).
- Can be used to protect LED lights.
- Installed at the boundaries of LPZ 2 – LPZ 3, as close as possible to the protected device (no further than 5 m).
- In front of HSA A-1P must be installed a lightning current and surge arrester T1 and T2 from HAKEL company.
- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; HD 60364-5-534:2016; CLC/TS 61643-12:2009

Type		HSA A-1P
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T3
Number of poles		2
Rated operating AC voltage	U_N	230 V
Maximum continuous operating voltage AC	U_C	275 V
Open circuit voltage of the combination wave generator	U_{OC}	6 kV (L/N, L/PE), 10 kV (N/PE)
Voltage protection level at U_{OC} (L/N)	U_p	< 1 kV
Voltage protection level at U_{OC} (L/PE, N/PE)	U_p	< 1.3 kV
Nominal discharge current for class II test (8/20) L/N, L/PE	I_n	3 kA
Nominal discharge current for class II test (8/20) N/PE	I_n	5 kA
Temporary overvoltage test (TOV) for $t_T = 5$ s (L/N)	U_T	337 V
Temporary overvoltage test (TOV) for $t_T = 120$ min (L/N)	U_T	440 V
Temporary overvoltage test (TOV) for $t_T = 0.2$ s (N/PE)	U_T	1 200 V
Maximal back-up fuse		16 A gL/gG
Residual current	I_{PE}	$\leq 5 \mu A$
Follow current interrupt rating (N/PE)	I_{fi}	0.1 kA _{rms}
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 70 °C
Humidity range	RH	5 ÷ 95 %
Recommended cross-section of connected conductors	S	2.5 mm ²
Installation		For window sill gutter 45 x 45 mm, In the installation box
Operating position		Any
Importance of local signaling		OK – no piezo siren, FAULT – piezo siren sound
Article number		32 007



HI32/15; HI16, HI16/15, HI32

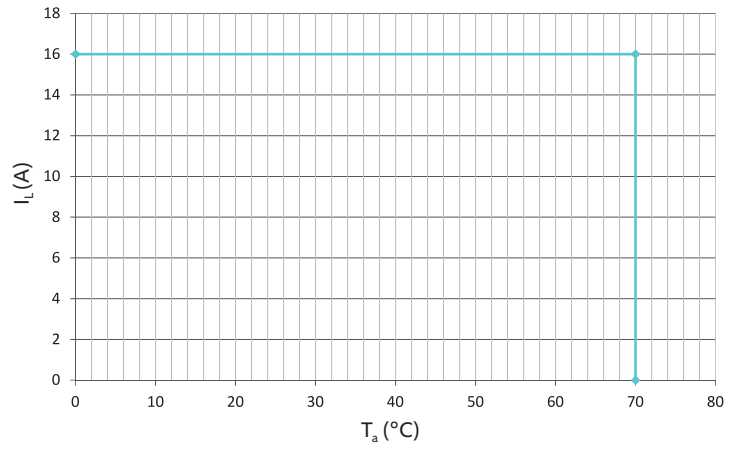
- Ensure the energy coordination between the arresters type T1 and T2 or the arresters type T2 and T3, especially in the places where there is no adequate distance between the arresters.
- If the energy coordination of surge protection is not observed, the excessive energy of passing impulse may cause a damage to the subsequent stage of the protective cascade.
- If there is at least 5 m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), it is possible to omit the decoupling element.

- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; CLC/TS 61643-12:2009

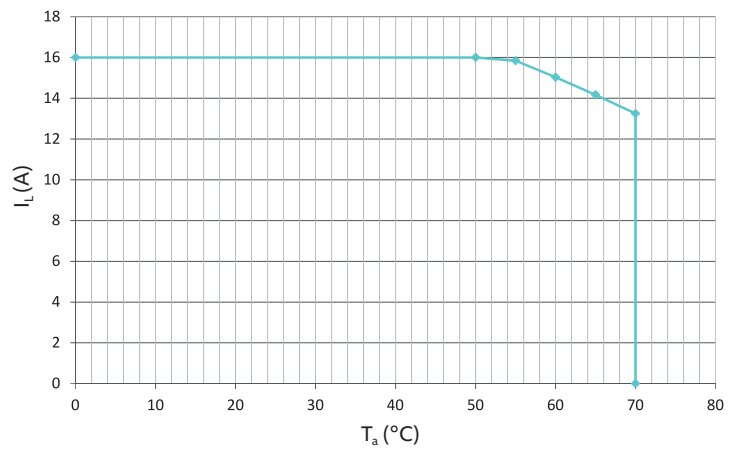
Type		HI16	HI16/15	HI32	HI32/15
Rated operating AC voltage	U_N	500 V			
Rated load current	I_L	16 A		32 A	
Inductance $\pm 10\%$	L	6 μH	15 μH	6 μH	15 μH
DC resistance	R	< 0.01 Ω			
Maximal back-up fuse		16 A gL/gG		32 A gL/gG	
Thermal class of insulation		A (105 °C)			
Housing material		Polyamid PA6, UL94 V-0			
Degree of protection		IP20			
Operating temperature	ϑ	-40 ÷ 70 °C			
Humidity range	RH	5 ÷ 95 %			
Recommended cross-section of connected conductors	S	6 mm ²		10 mm ²	
Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm ²			2.5 ÷ 25 mm ²
Installation		On DIN rail 35 mm			
Operating position		Any			
Article number		30 400	30 401	30 402	30 403

Charts of dependence of nominal current on ambient temperature

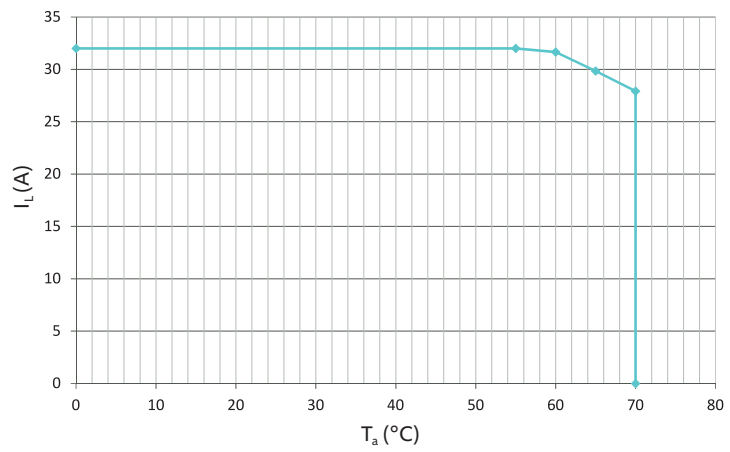
HI16 – Thermal insulation class A



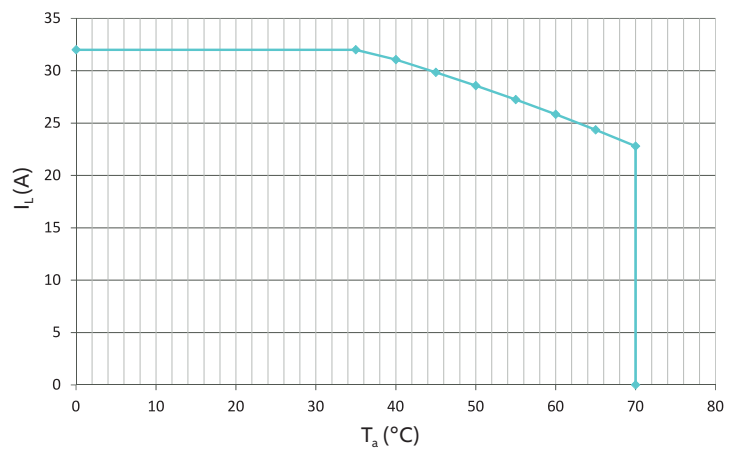
HI16/15 – Thermal insulation class A

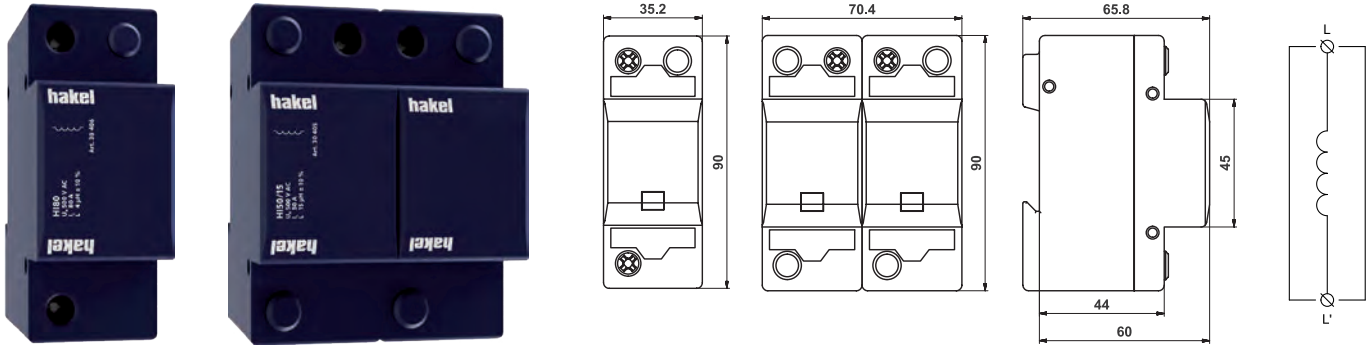


HI32 – Thermal insulation class A



HI32/15 – Thermal insulation class A





HI63, HI80; HI50/15

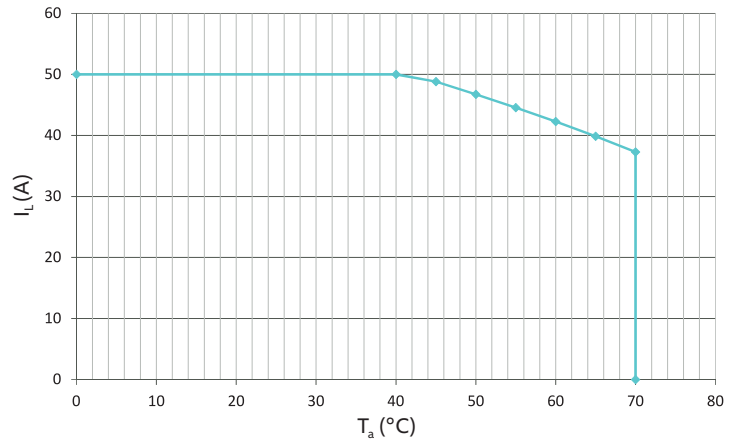
- Ensure the energy coordination between the arresters type T1 and T2 or the arresters type T2 and T3, especially in the places where there is no adequate distance between the arresters.
- If the energy coordination of surge protection is not observed, the excessive energy of passing impulse may cause a damage to the subsequent stage of the protective cascade.
- If there is at least 5 m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), it is possible to omit the decoupling element.

- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; CLC/TS 61643-12:2009

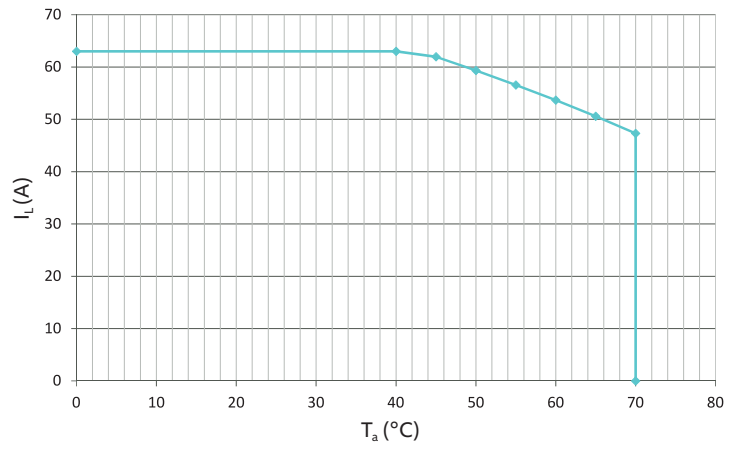
Type		HI50/15	HI63	HI80
Rated operating AC voltage	U_N		500 V	
Rated load current	I_L	50 A	63 A	80 A
Inductance $\pm 10\%$	L	15 μ H	6 μ H	4 μ H
DC resistance	R		< 0.01 Ω	
Maximal back-up fuse		50 A gL/gG	63 A gL/gG	80 A gL/gG
Thermal class of insulation		A (105 °C)		F (155 °C)
Housing material		Polyamid PA6, UL94 V-0		
Degree of protection		IP20		
Operating temperature	ϑ	-40 ÷ 70 °C		
Humidity range	RH	5 ÷ 95 %		
Recommended cross-section of connected conductors	S	16 mm ²		25 mm ²
Clamp fastening range (stranded conductor)		2.5 ÷ 25 mm ²		
Installation		On DIN rail 35 mm		
Operating position		Any		
Article number		30 405	30 404	30 406

Charts of dependence of nominal current on ambient temperature

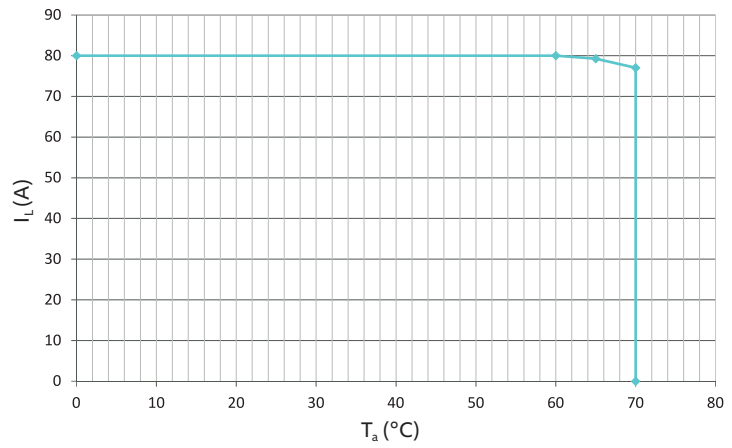
HI50/15 – Thermal insulation class A

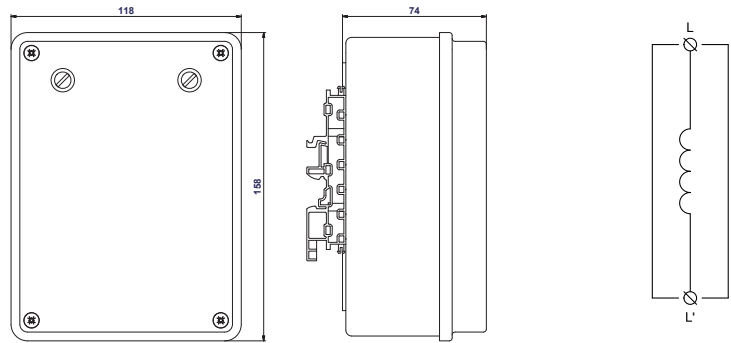


HI63 – Thermal insulation class A



HI80 – Thermal insulation class F





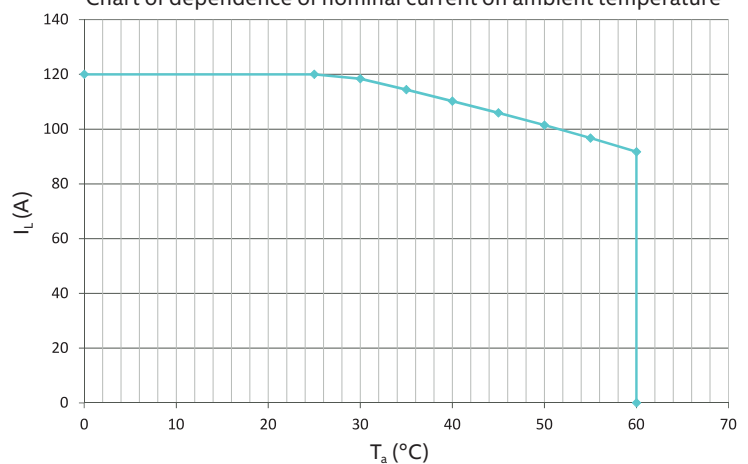
HI120

- Ensure the energy coordination between the arresters type T1 and T2 or the arresters type T2 and T3, especially in the places where there is no adequate distance between the arresters.
- If the energy coordination of surge protection is not observed, the excessive energy of passing impulse may cause a damage to the subsequent stage of the protective cascade.
- If there is at least 5 m distance between two successive arrester types (in case of two successive arrester types in two different switchboards), it is possible to omit the decoupling element.

- **Designed according to standards** IEC 61643-11:2011; UL 94
- **Application standards** IEC 62305:2010; CLC/TS 61643-12:2009

Type		HI120
Rated operating AC voltage	U_N	500 V
Rated load current	I_L	120 A
Inductance $\pm 10\%$	L	6 μ H
DC resistance	R	< 0.01 Ω
Maximal back-up fuse		120 A gL/gG
Thermal class of insulation		A (105 °C)
Housing material		ABS
Degree of protection		IP20
Operating temperature	ϑ	-40 ÷ 60 °C
Humidity range	RH	5 ÷ 95 %
Recommended cross-section of connected conductors	S	35 mm ²
Clamp fastening range (stranded conductor)		1.5 ÷ 35 mm ²
Installation		On DIN rail 35 mm
Operating position		Any
Article number		30 120

HI120 – Thermal insulation class A with ventilation holes
Chart of dependence of nominal current on ambient temperature



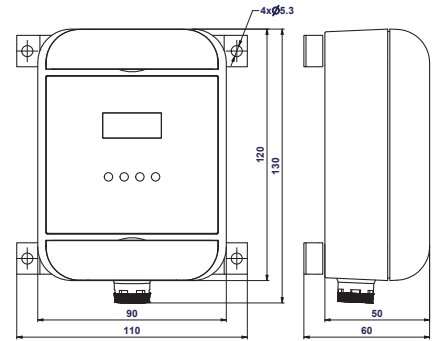


Scope of delivery: measuring instrument, twisted test lead with measuring tip, pouch, calibration certificate, warranty document, user's manual, cardboard shipping case.

GIGATEST PRO

- Digital measuring instruments of insulation resistance, voltage (AC and DC) and status of surge protection devices.
- Simple control with several multifunction buttons.
- The principle of measuring the status of surge protection devices consists in a linear voltage increase with the measurement of the so-called milliampere point at varistors and ignition voltage at gas discharge tubes.
- Evaluates the type of the measured element (varistor or gas discharge tube).
- The internal memory contains an extended database of surge protection devices, not only for HAKEL products.
- Multicolored graphic OLED display with excellent readability, patented system for storing the test pins.
- Possibility to illuminate the measured object by a bright LED light and charge the battery right in the instrument.
- Small dimensions and low weight.
- Complete technical parameters and operating information are contained in the user manual, which is available for download on our product web pages.

Type		GIGATEST PRO	
Protection class according to IEC 61140		II	
Surge category		CAT III / 300 V, CAT II / 600 V	
Insulation resistance measuring range	R_i	0.1 ÷ 9 999 M Ω	
Rated measuring voltage R_i	U_m	40 ÷ 1 000 V	
Measurement resolution R_i		According to the partial range	
Surge protection measuring range	U_{SPD}	40 ÷ 1 050 V	
Measurement resolution U_{SPD}		1 V	
DC and AC voltage measuring range (for $f = 45 \text{ Hz} \div 65 \text{ Hz}$)	U	0 ÷ 600 V	
Voltage measurement resolution		1 V	
Power supply		4 x AAA alkaline battery 1.5 V, NiMH accumulator 1.2 V	
Equipped with display		Yes (OLED technology)	
Degree of protection		IP40	
Dimensions of the measuring instrument		260 x 70 x 40 mm	
Article number		70 002	



PBI-7

- Digital counter of current pulses caused by lightning strikes to the object's air-termination network.
- Mounted directly on the lightning down conductor.
- By connecting the counter to the down lead of the air-termination network it is possible to get a detailed overview of the number of discharges and their time.
- Powered by an independent battery pack, the average battery lifetime is 5 years.
- The counter meets the requirements of Type I and Type II, thus responds to the course of lightning and switching overvoltage.
- **Designed according to standards IEC 62561-6:2018**

Type		PBI-7
Type according to IEC 62561-6:2018		Type I, Type II
Recordable current (10/350)	I_{imp}	1 ÷ 100 kA
Recordable current (8/20)	I_{in}	1 ÷ 100 kA
Number of recorded discharges		0 ÷ 999
Degree of protection		IP65
Operating temperature	ϑ	-20 ÷ 60 °C
Storage temperature		-40 ÷ 80 °C
Battery type		2 x CR123A, 2 x CR17335SE
Average battery lifetime		5 years
Product placement environment		External
Installation		For overhead line \varnothing 8 mm, Flat 30 x 4 mm down conductor
Operating position		Any
Operation type		Permanent
Article number		70 047

Why HAKEL?



more than 25 years
of experience



own testing laboratory



support
within 24 hours



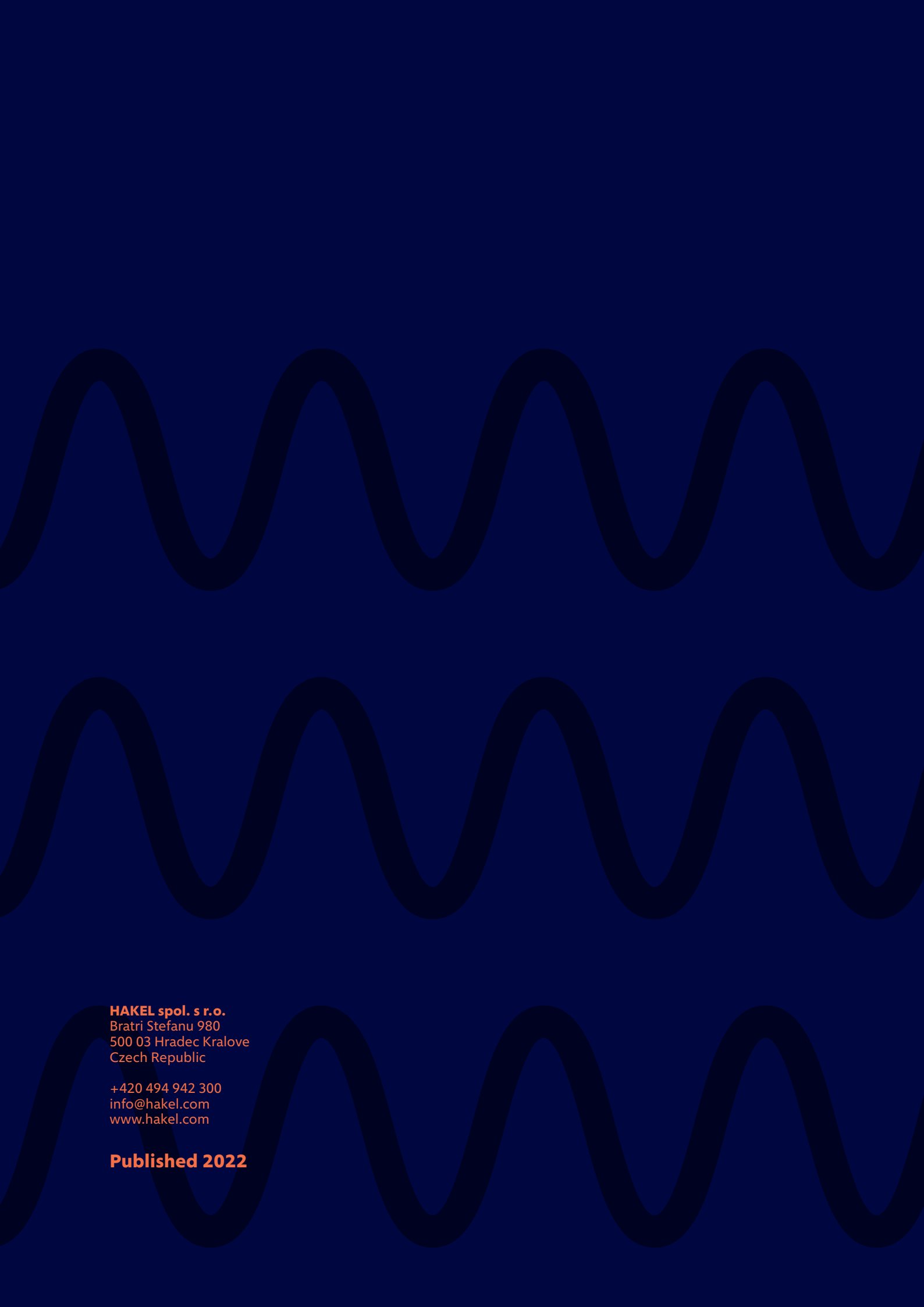
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worldwide export



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