

## HSAF16/110VDC

- 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.

Туре		HSAF16/110VDC
Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		Т3
System		DC
Rated operating DC voltage	U <sub>N</sub>	110 V
Maximum continuous operating voltage DC	U <sub>c</sub>	132 V
Rated load current	IL	16 A
Open circuit voltage of the combination wave generator (+/-, ±/PE)	U <sub>oc</sub>	6 kV
Voltage protection level at U <sub>OC</sub> (+/-)	$U_p$	< 0.9 kV
Voltage protection level at U <sub>OC</sub> (±/PE)	$U_p$	< 0.6 kV
Nominal discharge current for class II test (8/20) +/-, ±/PE	l <sub>n</sub>	3 kA
Total discharge current (8/20) ±->PE	I <sub>Total</sub>	6 kA
Asymmetrical attenuation of filter at f = 4 MHz		> 80 dB
Asymmetrical attenuation of filter at $f = 0.15 \div 30 \text{ MHz}$		> 35 dB
Response time (+/-)	t <sub>A</sub>	< 25 ns
Response time (±/PE)	t <sub>A</sub>	< 100 ns
Power dissipation	Pz	< 3.5 W
Maximal back-up fuse		16 A gL/gG
Residual current	I <sub>PE</sub>	≤ 1 800 µA
Short-circuit current rating at maximum back-up fuse	I <sub>SCCR</sub>	6 kA <sub>rms</sub>
Lightning protection zone		LPZ 2-3
Housing material		Polyamid PA6, UL94 V-0
Degree of protection		IP20
Operating temperature	9	-40 ÷ 55 °C
Humidity range	RH	5 ÷ 95 %
Recommended cross-section of connected conductors	S	2.5 mm <sup>2</sup>
Clamp fastening range (solid conductor)		$0.2 \div 6 \text{ mm}^2$
Clamp fastening range (stranded conductor)		0.2 ÷ 4 mm <sup>2</sup>
Tightening moment		0,5 Nm
Installation		On DIN rail 35 mm

## Surge arresters T3 with EMI/RFI filter for DC systems



Operating position Product placement environment Signalling at the device Optic Internal Signalling at the device Optic Importance of local signaling OK - red light off FAULT - red light off FAULT - red light on Remote signalling No Includes EMI / EMC filter Yes Modular design No Designed according to standards Requirements and test methods for SPDs connected to low-voltage power systems Requirements and test methods for SPDs connected to low-voltage power systems Safety of Flammability of Plastic Materials UL 94  Application standards Protection against lightning Selection and erection of electrical equipment - Switchgear and controlgear Selection and application principles for SPDs connected to low-voltage power systems  Drodering, packaging and additional data  Mass  Mass (including the packaging) Mass (including the packaging)  Packaging value  V 0.5 dm³ ETIM group EG000021 ETIM class EAN code 859681161296	Туре		HSAF16/110VDC
Product placement environment Signalling at the device Moportance of local signalling Mortance of local signalling Mortance of local signalling Mortance of local signalling Mortance of local signalling No Includes EMI / EMC filter Yes Modular design No Lifetime Yes Modular design No Designed according to standards Requirements and test methods for SPDs connected to low-voltage power systems Requirements and test methods for SPDs connected to low-voltage power systems Requirement of the suppression characteristics of passive EMC filtering devices Safety of Flammability of Plastic Materials UL 94 Application standards Protection against lightning Selection and erection of electrical equipment – Switchgear and controlgear Selection and application principles for SPDs connected to low-voltage power systems Drodering, packaging and additional data  Mass Mass (including the packaging) Mass (i	Modular width		3 TE
Signalling at the device Optic Importance of local signaling Remote signalling Reposition Reposition Remote signalling Remote standards Requirements and test methods for SPDs connected to low-voltage power systems Requirements and test methods for SPDs connected to low-voltage power systems Recommendation of Plastic Materials Respection standards Reposition standards Reposition standards Reposition standards Recommendation of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and application principles for SPDs connected to low-voltage power systems Recommendation of electrical equipment of the switchgear and controlgear Reposition and application principles for SPDs connected to low-voltage power systems Recommendation of electrical equipment – Switchgear and controlgear Reposition and application principles for SPDs connected to low-voltage power systems Recommendation of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electrical equipment – Switchgear and controlgear Reposition and erection of electr	Operating position		Any
Importance of local signaling  Remote signalling	Product placement environment		Internal
FAULT - red light on Remote signalling No ncludes EMI / EMC filter Yes Modular design No No Lifetime Semander design No	Signalling at the device		Optic
Includes EMI / EMC filter  Modular design  Modular design  No  Designed according to standards  Requirements and test methods for SPDs connected to low-voltage power systems  Methods of measurement of the suppression characteristics of passive EMC filtering devices  Safety of Flammability of Plastic Materials  UL 94  Application standards  Protection against lightning  Selection and erection of electrical equipment – Switchgear and controlgear  Selection and application principles for SPDs connected to low-voltage power systems  Drdering, packaging and additional data  Mass (including the packaging)  Packaging dimensions (H x W x D)  Packaging value  V  0.5 dm³  ETIM group  ETIM class  EC000942  EXISTANCODE  8590681161296	Importance of local signaling		
Modular design No Lifetime > 100 000 h  Designed according to standards Requirements and test methods for SPDs connected to low-voltage power systems Methods of measurement of the suppression characteristics of passive EMC filtering devices Safety of Flammability of Plastic Materials UL 94  Application standards Protection against lightning IEC 62305:2010 Selection and erection of electrical equipment – Switchgear and controlgear HD 60364-5-53:2022 Selection and application principles for SPDs connected to low-voltage power systems  Ordering, packaging and additional data  Mass m 180 g Mass (including the packaging) m 204 g Packaging dimensions (H x W x D) 60 x 113 x 73 mm  Packaging value V 0.5 dm³ ETIM group EG000021 ETIM class EC000942 Customs tariff no. 85363010 EAN code 8590681161296	Remote signalling		No
Lifetime > 100 000 h  Designed according to standards Requirements and test methods for SPDs connected to low-voltage power systems Methods of measurement of the suppression characteristics of passive EMC filtering devices  Safety of Flammability of Plastic Materials  UL 94  Application standards Protection against lightning Selection and erection of electrical equipment – Switchgear and controlgear Selection and application principles for SPDs connected to low-voltage power systems  Drdering, packaging and additional data  Mass  m 180 g Mass (including the packaging) Packaging dimensions (H x W x D) Packaging value  V 0.5 dm³  ETIM group  ETIM group  ETIM class  Customs tariff no.  EAN code  8590681161296	Includes EMI / EMC filter		Yes
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Application standards Protection against lightning Selection and erection of electrical equipment – Switchgear and controlgear Selection and application principles for SPDs connected to low-voltage power systems CLC/TS 61643-12:2009  Ordering, packaging and additional data  Mass m 180 g Mass (including the packaging) m 204 g Packaging dimensions (H x W x D) Packaging value V 0.5 dm³ ETIM group ETIM class Customs tariff no. 85363010 EAN code	Methods of measurement of the suppression characteristics of passive EMC filtering devices		EN 55017:2011 / CISPR 17:2011
Protection against lightning  Selection and erection of electrical equipment – Switchgear and controlgear  Selection and application principles for SPDs connected to low-voltage power systems  CLC/TS 61643-12:2009  Ordering, packaging and additional data  Mass  Mass (including the packaging)  Packaging dimensions (H x W x D)  Packaging value  V  0.5 dm³  ETIM group  ETIM group  ETIM class  Customs tariff no.  EAN code  IEC 62305:2010  HD 60364-5-53:2022  CLC/TS 61643-12:2009  DLC/TS 61643-12:2009  DLC/TS 61643-12:2009  DLC/TS 61643-12:2009  CLC/TS 61643-12:2009  DLC/TS 61643-12:2009  DLC	Safety of Flammability of Plastic Materials		UL 94
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Ordering, packaging and additional data         m         180 g           Mass (including the packaging)         m         204 g           Packaging dimensions (H x W x D)         60 x 113 x 73 mm           Packaging value         V         0.5 dm³           ETIM group         EG000021           ETIM class         EC000942           Customs tariff no.         85363010           EAN code         8590681161296	Selection and erection of electrical equipment – Switchgear and controlgear		HD 60364-5-53:2022
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EAN code 8590681161296	ETIM class		EC000942
	Customs tariff no.		85363010
Art. number 30 331	EAN code		8590681161296
	Art. number		30 331

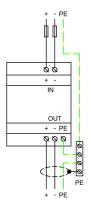


**The link in the QR code** leads to the online presentation of the **HSAF16/110VDC**. There, in addition to the always up-to-date data sheet, you will also find all diagrams and drawings, declarations of conformity, or 2D or 3D models and other necessary materials. For more information, visit **www.hakel.com** 





## Application wiring diagram (installation)



## Internal diagram

