

## HSA-440/3+0

- 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.

Test class according to EN 61643-11:2012 (IEC 61643-11:2011)T2, T3SystemT0,TN-CNumber of poles3Rated operating AC voltageU <sub>N</sub> 400 VMaximum continuous operating voltage ACU <sub>c</sub> 440 VMaximum discharge current (8/20)In,15 kAOpen circuit voltage of the combination wave generatorIn,15 kAOtal discharge current (8/20) L1+L2-L3->PENIneral120 kAVoltage protection level at In,Up,<1.1 kVVoltage protection level at In,Up,<1.4 kVTemporary overvoltage test (TOV) for tr, = 5 sU T36 kVResponse timeIka<25 nsMaximal back-up fuseIka<25 nsMaximal back-up fuseIka<25 nsResponse timeIka<25 nsResidual currentIka<10 kL2 LPZ 2.3Housing materialIka<10 kL2 LPZ 2.3Degree of protection connected Cu conductors accord. to HD 60364-5-53:20228Minimum conse-section of connected Cu conductors accord. to HD 60364-5-53:2022940 + 70 * CMinimum conse-section of connected Cu conductors accord. to HD 60364-5-53:2022815 + 25 mm²Clam fastening range (solid conductor)I15 + 16 mm²15 + 16 mm²Clam fastening range (solid conductor)I15 + 25 mm²15 + 16 mm²Clam fastening range (solid conductor)ISonn15 + 16 mm²Clam fastening range (solid conductor)ISonn15 + 16 mm²Clam fastening range (solid con	Туре		HSA-440/3+0
Number of poles3Rated operating AC voltage $U_N$ 400 VMaximum continuous operating voltage AC $U_C$ 440 VMaximum discharge current (8/20) $I_m_{max}$ 40 kANominal discharge current for class II test (8/20) $I_n$ 15 kAOpen circuit voltage of the combination wave generator $U_{OC}$ 6 kVTotal discharge current (8/20) L1+L2+L3->PEN $I_{rotal}$ 120 kAVoltage protection level at $I_n$ $U_p$ <1.7 kV	Test class according to EN 61643-11:2012 (IEC 61643-11:2011)		T2, T3
Rated operating AC voltageUN400 VMaximum continuous operating voltage ACUC440 VMaximum discharge current (8/20)Imax40 kANominal discharge current for class II test (8/20)In15 kAOpen circuit voltage of the combination wave generatorUOC6 kVTotal discharge current (8/20) L1+L2+L3->PENIrotal120 kAVoltage protection level at InUp<1.7 kV	System		TN-C
Maximum continuous operating voltage ACUc440 VMaximum continuous operating voltage ACUc440 VMaximum discharge current (8/20)In15 kAOpen circuit voltage of the combination wave generatorUoc6 kVTotal discharge current (8/20) L1+L2+L3->PENIroual120 kAVoltage protection level at InUp<1.7 kV	Number of poles		3
Maximum discharge current (8/20) $I_{max}$ 40 kANominal discharge current for class II test (8/20) $I_n$ 15 kAOpen circuit voltage of the combination wave generator $U_{DC}$ 6 kVTotal discharge current (8/20) L1+L2+L3->PEN $I_{rotal}$ 120 kAVoltage protection level at $I_n$ $U_p$ <1.7 kV	Rated operating AC voltage	U <sub>N</sub>	400 V
Nominal discharge current for class II test (8/20)In n15 kAOpen circuit voltage of the combination wave generator $U_{OC}$ 6 kVTotal discharge current (8/20) L1+L2+L3->PEN $I_{Total}$ 120 kAVoltage protection level at In Voltage protection level at Uoc $U_p$ <1.7 kV	Maximum continuous operating voltage AC	Uc	440 V
Open circuit voltage of the combination wave generator $U_{oc}$ 6 kVTotal discharge current (8/20) L1+L2+L3->PEN $I_{rotal}$ 120 kAVoltage protection level at $I_n$ $U_p$ < 1.7 kV	Maximum discharge current (8/20)	I <sub>max</sub>	40 kA
Total discharge current (8/20) L1+L2+L3->PENTotal discharge	Nominal discharge current for class II test (8/20)	l <sub>n</sub>	15 kA
NameNameNameVoltage protection level at $I_n$ Up< 1.7 kV	Open circuit voltage of the combination wave generator	U <sub>oc</sub>	6 kV
Voltage protection level at $U_{oc}$ $U_p$ < 1.4 kVTemporary overvoltage test (TOV) for $t_T = 5$ s $U_T$ 580 VTemporary overvoltage test (TOV) for $t_T = 120$ min $U_T$ 762 VResponse time $t_A$ <25 ns	Total discharge current (8/20) L1+L2+L3->PEN	I <sub>Total</sub>	120 kA
Temporary overvoltage test (TOV) for $t_r = 5 s$ U TU T580 VTemporary overvoltage test (TOV) for $t_r = 120 min$ U T762 VResponse timet A<25 ns	Voltage protection level at In	Up	< 1.7 kV
Temporary overvoltage test (TOV) for $t_T = 120 \text{ min}$ $U_T$ 762 VResponse time $t_A$ <25 ns	Voltage protection level at U <sub>oc</sub>	U <sub>p</sub>	< 1.4 kV
Response timet_A< 25 nsMaximal back-up fuse160 A gL/gGResidual current160 A gL/gGResidual current160 A gL/gGShort-circuit current rating at maximum back-up fuse160 KArmsLightning protection zone1Housing materialEVZ 1-2, LPZ 2-3Polyamid PA6, UL94 V-01P20Degree of protection9Operating temperature9-40 ÷ 70 °CHumidity rangeRHS ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022 (doesn't apply to "V" connection) for T2Clamp fastening range (solid conductor)1.5 ÷ 25 mm²Clamp fastening range (solid conductor)1.5 ÷ 16 mm²Tightening moment3 NmInstallationOn DIN rail 35 mm	Temporary overvoltage test (TOV) for $t_T = 5 \text{ s}$	U <sub>T</sub>	580 V
Maximal back-up fuse160 A gL/gGResidual current $I_{PE}$ $\leq 400 \ \mu A$ Short-circuit current rating at maximum back-up fuse $I_{SCCR}$ $60 \ kA_{rms}$ Lightning protection zone $I_{SCCR}$ $60 \ kA_{rms}$ Housing materialPolyamid PA6, UL94 V-0Degree of protection $9$ $-40 \div 70 \ °C$ Humidity range $9$ $-40 \div 70 \ °C$ Humidity rangeRH $5 \div 95 \ \%$ Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022S $2.5 \ mn^2$ (L, N) $6 \ mm^2$ (PE, PEN)Clamp fastening range (solid conductor) $1.5 \div 16 \ mm^2$ $1.5 \div 16 \ mm^2$ Tightening moment $On \ DIN \ rail 35 \ mm$ On DIN rail 35 \ mm	Temporary overvoltage test (TOV) for $t_T = 120$ min	U <sub>T</sub>	762 V
Residual currentI PE≤ 400 μÅShort-circuit current rating at maximum back-up fuseI SccR60 kArmsLightning protection zoneILPZ 1-2, LPZ 2-3Housing materialPolyamid PA6, UL94 V-0Degree of protectionIP20Operating temperature\$-40 ÷ 70 °CHumidity rangeRH5 ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022 (doesn't apply to "V" connection) for T2S2.5 mm² (L, N) 6 mm² (PE, PEN)Clamp fastening range (solid conductor)1.5 ÷ 25 mm²1.5 ÷ 16 mm²Tightening momentI3 Nm3 NmInstallationOn DIN rail 35 mm0n DIN rail 35 mm	Response time	t <sub>A</sub>	< 25 ns
Note that concernThe DistributionShort-circuit current rating at maximum back-up fuseIICCC <td>Maximal back-up fuse</td> <td></td> <td>160 A gL/gG</td>	Maximal back-up fuse		160 A gL/gG
Lightning protection zone LPZ 1-2, LPZ 2-3 Polyamid PA6, UL94 V-0 Degree of protection O Operating temperature $\vartheta$ -40 ÷ 70 °C Humidity range $\vartheta$ -40 ÷ 70 °C Humidity range RH 5 ÷ 95 % Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022 S 2.5 mm² (L, N) (doesn't apply to "V" connection) for T2 S $\theta$ mm² (PE, PEN) Clamp fastening range (solid conductor) 1.5 ÷ 25 mm² Clamp fastening range (solid conductor) 1.5 ÷ 16 mm² Tightening moment S $\vartheta$ On DIN rail 35 mm	Residual current	I <sub>PE</sub>	≤ 400 μA
Housing materialPolyamid PA6, UL94 V-0Degree of protectionØIP20Operating temperatureØ-40 ÷ 70 °CHumidity rangeRH5 ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022 (doesn't apply to "V" connection) for T2S2.5 mm² (L, N) 6 mm² (PE, PEN)Clamp fastening range (solid conductor)I.5 ÷ 25 mm²1.5 ÷ 16 mm²Clamp fastening range (stranded conductor)I.5 ÷ 16 mm²3 NmInstallationOn DIN rail 35 mmInterval	Short-circuit current rating at maximum back-up fuse	I <sub>SCCR</sub>	60 kA <sub>rms</sub>
Degree of protectionIP20Operating temperatureθ-40 ÷ 70 °CHumidity rangeRH5 ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022S2.5 mm² (L, N) 6 mm² (PE, PEN)(doesn't apply to "V" connection) for T2I1.5 ÷ 25 mm²Clamp fastening range (solid conductor)I1.5 ÷ 16 mm²Clamp fastening range (stranded conductor)I3 NmTightening momentOn DIN rail 35 mm	Lightning protection zone		LPZ 1-2, LPZ 2-3
Operating temperature9-40 ÷ 70 °CHumidity rangeRH5 ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022S2.5 mm² (L, N) 6 mm² (PE, PEN)(doesn't apply to "V" connection) for T26 mm² (PE, PEN)1.5 ÷ 25 mm²Clamp fastening range (solid conductor)1.5 ÷ 25 mm²1.5 ÷ 16 mm²Clamp fastening range (stranded conductor)1.5 ÷ 16 mm²3 NmInstallationOn DIN rail 35 mm1.5 mm²	Housing material		Polyamid PA6, UL94 V-0
Humidity rangeRH5 ÷ 95 %Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022 (doesn't apply to "V" connection) for T2S2.5 mm² (L, N) 6 mm² (PE, PEN)Clamp fastening range (solid conductor)1.5 ÷ 25 mm²1.5 ÷ 25 mm²Clamp fastening range (stranded conductor)1.5 ÷ 16 mm²Tightening moment3 NmInstallationOn DIN rail 35 mm	Degree of protection		IP20
Minimum cross-section of connected Cu conductors accord. to HD 60364-5-53:2022   S   2.5 mm² (L, N)     (doesn't apply to "V" connection) for T2   6 mm² (PE, PEN)     Clamp fastening range (solid conductor)   1.5 ÷ 25 mm²     Clamp fastening range (stranded conductor)   1.5 ÷ 16 mm²     Tightening moment   3 Nm     Installation   On DIN rail 35 mm	Operating temperature	θ	-40 ÷ 70 °C
(doesn't apply to "V" connection) for T26 mm² (PE, PEN)Clamp fastening range (solid conductor)1.5 ÷ 25 mm²Clamp fastening range (stranded conductor)1.5 ÷ 16 mm²Tightening moment3 NmInstallationOn DIN rail 35 mm	Humidity range	RH	5 ÷ 95 %
Clamp fastening range (stranded conductor) 1.5 ÷ 16 mm²   Tightening moment 3 Nm   Installation On DIN rail 35 mm		S	
Tightening moment 3 Nm   Installation On DIN rail 35 mm	Clamp fastening range (solid conductor)		1.5 ÷ 25 mm <sup>2</sup>
Installation On DIN rail 35 mm	Clamp fastening range (stranded conductor)		1.5 ÷ 16 mm <sup>2</sup>
	Tightening moment		3 Nm
Modular width 3 TE	Installation		On DIN rail 35 mm
	Modular width		3 TE

## Surge arresters T2+T3

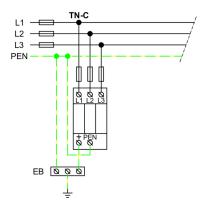


Туре		HSA-440/3+0
Operating position		Any
Product placement environment		Internal
Signalling at the device		Optic
Importance of local signaling		OK – clear target FAULT – red target
Remote signalling		No
Modular design		No
Lifetime		> 100 000 h
Designed according to standards		
Requirements and test methods for SPDs connected to low-voltage power systems		IEC 61643-11:2011
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		CLC/TS 61643-12:2009
Ordering, packaging and additional data		
Mass	m	306 g
Mass (including the packaging)	m	330 g
Packaging dimensions (H x W x D)		60 x 113 x 73 mm
Packaging value	V	0.5 dm <sup>3</sup>
ETIM group		EG000021
ETIM class		EC000941
Customs tariff no.		85363010
EAN code		8590681115510
Art. number		24 572

**The link in the QR code** leads to the online presentation of the **HSA-440/3+0**. 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

