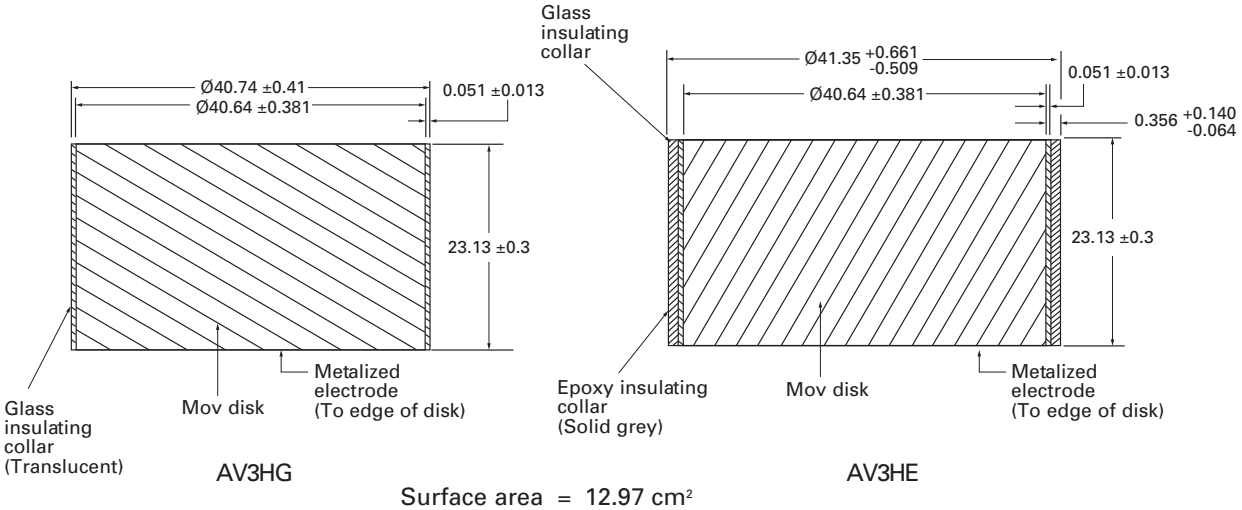
Surge Arresters
Technical Data
TD235026EN

Effective August 2017
Supersedes November 2003 (TD-228)

COOPER POWER SERIES

Technical specifications for 10 kA, heavy-duty class 1, 3 kV and 3.33 kV VariSTAR® MOV disks



Surface area = 12.97 cm^2
volume = 29.83 cm^3

Powering Business Worldwide

Application

The VariSTAR MOV (Metal Oxide Varistor) disks described in this Technical Data sheet are for use as active elements in IEC 10 kA Class 1 and ANSI Heavy-Duty Distribution Class Surge Arresters, when applied in an appropriately designed arrester.

Polymer housed arrester designs

Use the glass collared AV3HG series VariSTAR disks, when applying disks to a polymer housed arrester, where the dielectric strength of the material in direct contact with the disks exceeds the dielectric strength of air.

Porcelain housed arrester designs

Option 1.

Use the glass collared AV3HG series VariSTAR disk together with an Epoxy Film Tape, as described in technical data sheet TD-241, when applying disks in a porcelain housed arrester, where the material in direct contact with the VariSTAR disks is equal to the dielectric strength of air.

Option 2.

Use the epoxy collared AV3HE series VariSTAR disks, when applying disks in a porcelain housed arrester, where the dielectric strength of the material in direct contact with the disks is equal to the dielectric strength of air.

Electrical properties for AV3HG and AV3HE series VariSTAR disks are otherwise identical.

Catalog number reference:
AV3 = Disk Size
H = Heavy-Duty, 10 kA
G/E = Glass or Epoxy Collar
PA/PB = Rating Designation

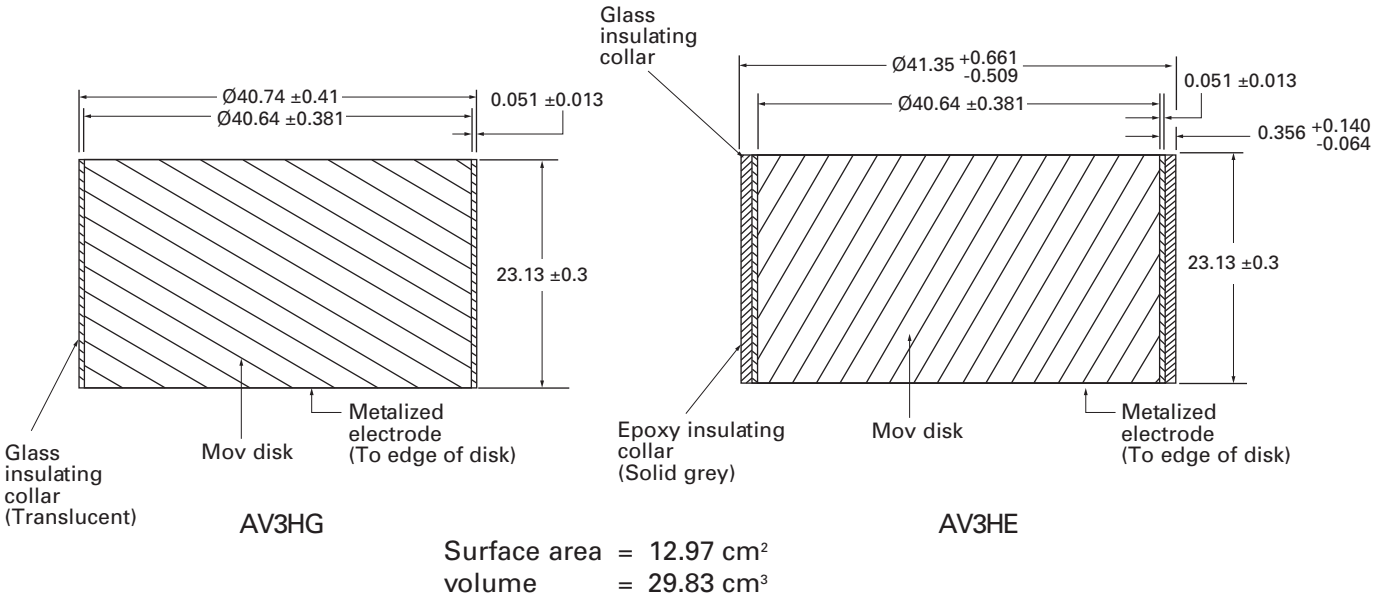


Figure 1. Dimensions AV3HG VariSTAR disk and AV3HE VariSTAR disk in mm

Table 1. Suggested usage & class ratings

Catalog number	Suggested U_r (Rating)	Suggested U_c (MCOV)	IEC LD current withstand	ANSI LCLD class	IEC high current ANSI HCSD	Iref
AV3HEPA	3.00 kV	2.63 kV	Class 1	250 A 2000 µs	100 kA	5 mA
AV3HGPA						
AV3HEPB	3.33 kV	2.84 kV	Class 1	250 A 2000 µs	100 kA	5 mA
AV3HGPB						

Table 2. Maximum residual voltages

Catalog number	Rating (kV)	MCOV (kV rms)	0.5 µsec (ANSI) kV @ 10 kA	1.0 µsec (IEC) kV @ 10 kA	kV @ 125 A switching surge	kV @ 500 A switching surge	8/20 µs wave forms					
							kV pk @ 1.5 kA	kV pk @ 3 kA	kV pk @ 5 kA	kV pk @ 10 kA	kV pk @ 20 kA	kV pk @ 40 kA
AV3HEPA	3	2.63	11.2	11.0	7.2	7.7	8.3	8.9	9.3	10.1	11.2	12.8
AV3HGPA												
AV3HEPB	3.33	2.84	12.0	11.8	7.7	8.2	8.9	9.5	9.9	10.8	11.9	13.7
AV3HGPB												

Note: Values other than $V_{10\ kA}$ are typical values.

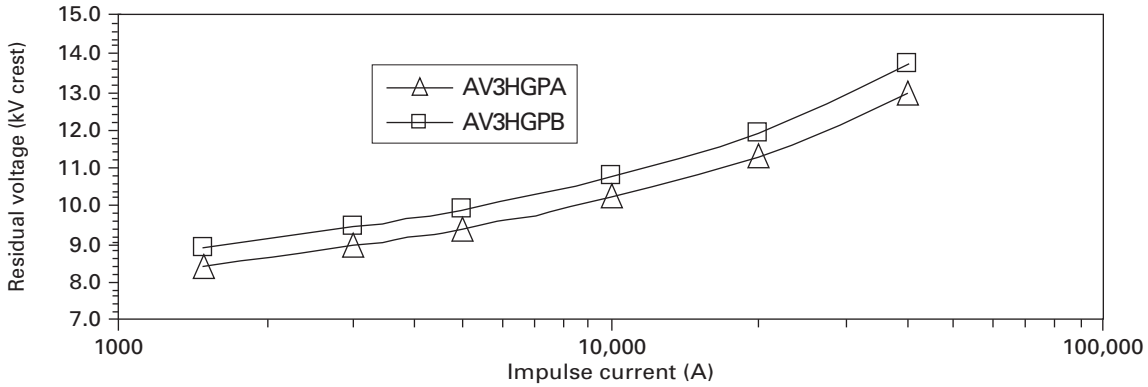


Figure 2. Maximum residual voltage vs. impulse current

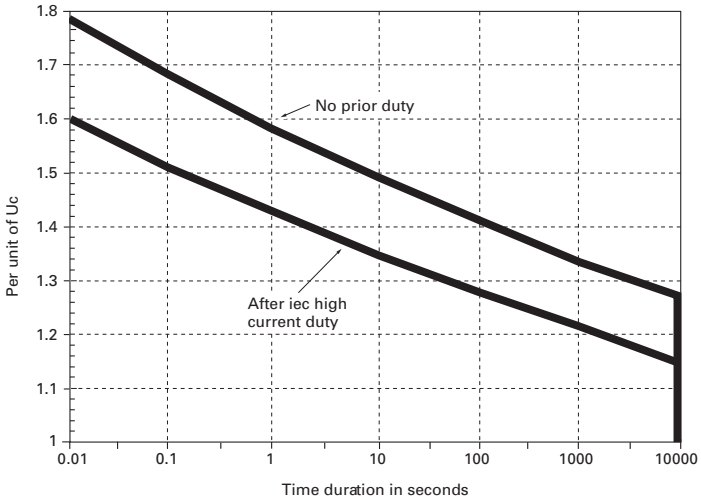


Figure 3. Temporary overvoltage capability, 60°C

Note: The TOV capability will depend on the design and thermal capability of the arrester. The above TOV curve represents a typical Eaton Cooper Power series design.

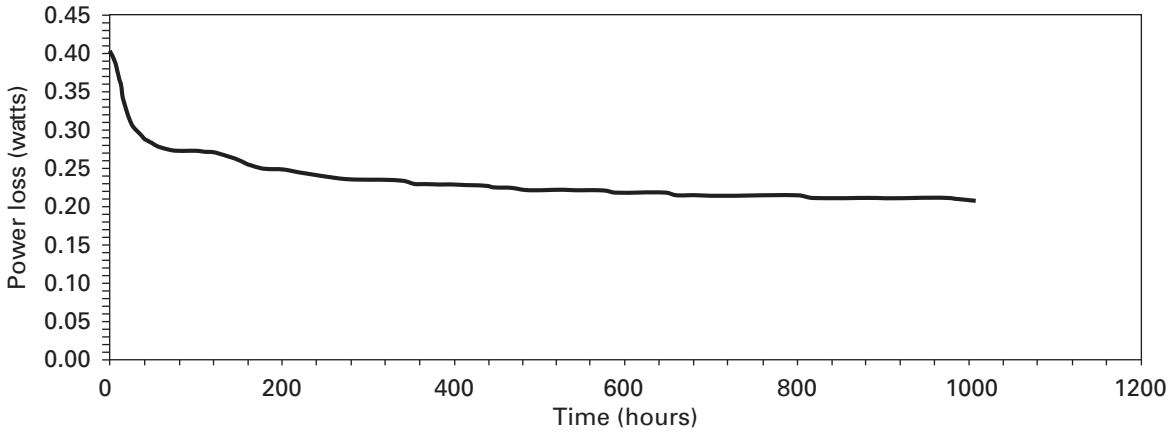


Figure 4. Aging curve AV3HG and AV3HE VariSTAR disks

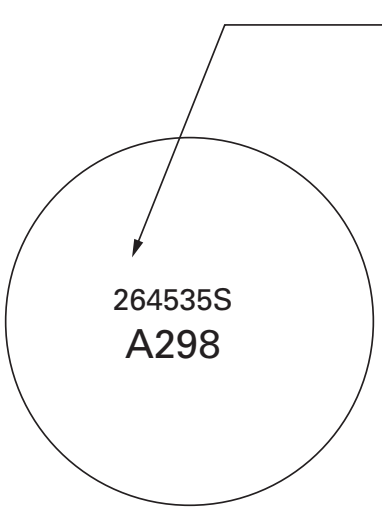
Aging factors based on the IEC and ANSI 1000 hour power loss tests are guaranteed to be less than or equal to 1. The 1000 hour test is performed at 115°C, which is equivalent to 110 years with the operating temperature at 40°C and operating voltages less than or equal to COV. See Figure 4.

Factory routine tests performed on each disk

- Physical Inspection
- Residual Voltage Measurement (referenced to 10 kA, 8/20 µs)
- V_{1mA/cm^2} (DC voltage at 12.97 mA)
- Power Loss @ 0.551 of V_{1mA/cm^2} Voltage

Table 3. Guaranteed characteristics based on 100% testing

Catalog number	Min. V_{1mA/cm^2} (kV DC)	Max. V_{10kA} (kV)
AV3HEPA	5.00	10.1
AV3HGPA		
AV3HEPB	5.41	10.8
AV3HGPB		



Top line:

Digit 1 . . . . . Factory No. (May be numeral or letter designation)
Digit 2 . . . . . Last Digit of Year of Manufacture
Digits 3, 4, 5, 6 . . . Factory Lot Number
Digit 7 . . . . . Factory Use Only

Second line:

Digit 1 . . . . . Rating Code (See Table 4 below)
Digit 2 . . . . . Factory Use Only
Digits 3 (& 4) . . . . . Disk Sub-category per Table 5

Figure 5. Disk identification system

Table 4. Disk category

Rating code	Min. catalog number	Min. V_{1mA/cm^2} (kV DC)	Max. V5 kA (kV)	Power loss test: Test voltage kV rms	Power loss test: Watts @ 20° C	Min. V_{ref} @ I_{ref} of 5 mA (kV)
A	AV3HEPA	5.00	10.1	2.76	0.212	3.48
	AV3HGPA					
B	AV3HEPB	5.41	10.8	2.98	0.224	3.76
	AV3HGPB					

Table 5. Disk sub-category

Second line digits 3 (& 4)	Minimum V_{10kA} (kV)	Maximum V_{10kA} (kV)
80	7.91	8.00
81	8.01	8.10
82	8.11	8.20
83	8.21	8.30
84	8.31	8.40
85	8.41	8.50
86	8.51	8.60
87	8.61	8.70
88	8.71	8.80
89	8.81	8.90
90	8.91	9.00
91	9.01	9.10
92	9.11	9.20
93	9.21	9.30
94	9.31	9.40
95	9.41	9.50
96	9.51	9.60
97	9.61	9.70
98	9.71	9.80
99	9.81	9.90
00	9.91	10.00
01	10.01	10.10
02	10.11	10.20
03	10.21	10.30
04	10.31	10.40
05	10.41	10.50
06	10.51	10.60
07	10.61	10.70
08	10.71	10.80

Note: For individual disk reference only. Not for ordering.

Storage and handling

The VariSTAR MOV disks are packaged on wooden pallets and secured for ocean container shipment. The pallet/boxes shall be stored indoors until the purchaser's acceptance test. Once opened, the disks shall be stored in a dry and clean environment to avoid moisture or other contaminants to collect on the disk surface. The MOV disk should not be handled with bare hands. A latex or other non-fibrous glove should be used to prevent contaminants from compromising the collar of the disk.

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ISO 9001-Certified Quality Management System

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For Eaton's Cooper Power series surge arrester product information call 1-877-277-4636 or visit: www.eaton.com/cooperpowerseries.