

# Surge Arresters

## UltraSIL Housed VariSTAR Surge Arresters 5 kA and 10 kA Class 1 IEC 60099-4 for MV Systems to 36 kV

Electrical Apparatus  
**1235-35**

### GENERAL

The advantages of polymer housed arresters — reduced size and weight, and enhanced safety — have been refined in this new generation of surge arresters: the UltraSIL housed arrester from Cooper Power Systems.

The UltraSIL housed surge arrester incorporates the industry recognized superior polymeric material — silicone rubber.

Using Metal Oxide Varistors (MOVs) having excellent electrical properties, these arresters provide superior overvoltage protection for MV distribution systems. Manufacturing our own MOV disks allows strict quality control over the manufacturing process from start to finish.

After production, every MOV disk must pass a series of electrical tests designed to ensure the highest individual disk quality. These MOV disks have proven their reliability and protective abilities through years of in-service use.

UltraSIL housed VariSTAR arresters are available in 5 kA and 10 kA Class 1 IEC 60099-4 designs.

### CONSTRUCTION

The MOV disks are combined with aluminum end electrodes and are encapsulated in a high-strength composite wrap insulating material on our fully automated assembly line using strict quality control processes that eliminate manufacturing variances. The composite collar is cured to the MOV disk stack to form a solid insulation MOV disk module system that is inserted and bonded to the industry leading track resistant UltraSIL silicone rubber housing. This exclusive Cooper Power Systems patented manufacturing process forms a secondary moisture seal under the primary silicone rubber housing seal, which makes the arrester impervious to moisture and capable of withstanding extreme electrical, environmental and cantilever load conditions. The composite wrapped UltraSIL arrester design represents a quantum leap in polymer arrester technology.

### FEATURES

The UltraSIL silicone rubber housing has undergone a wide range of design tests to determine the optimum shed configuration. In addition, long term environmental testing has verified the lifetime superiority of UltraSIL silicone rubber when compared to other polymeric insulating materials.

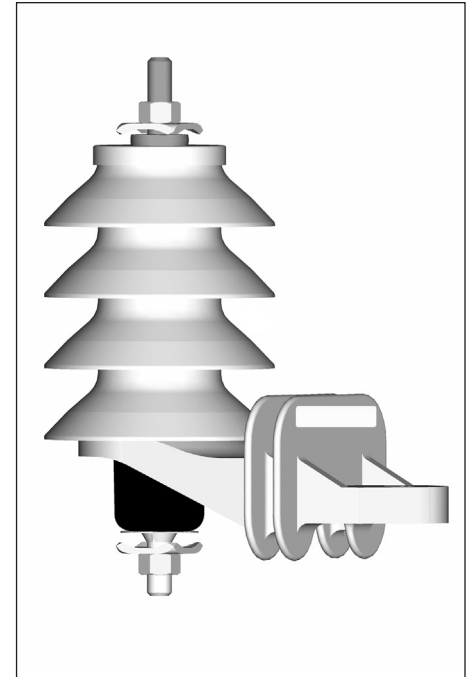
Independent laboratory tests have verified the superiority of silicone rubber in terms of hydrophobicity, resistance to UV and surface tracking performance in contaminated environments, chemical inertness, temperature stability and other key insulating properties.

UltraSIL silicone rubber will not support biological growth (algae and mildew) and is non-flammable.

A ground lead disconnecter is optionally available for use on systems having 20A or more of available fault current. The disconnecter will sense and disconnect the ground terminal in the unlikely event of arrester failure, preventing a permanent system short circuit. A disconnecter that has operated gives a visual indication of internal arrester damage and the need for arrester replacement. See Figure 8 for the disconnecter operating characteristics.

### OPERATION

The operation of the VariSTAR arrester is typical of gapless metal oxide arresters. During steady state conditions, line-to-ground voltage is continuously across the arrester



**Figure 1.**  
10 kV UltraSIL housed VariSTAR surge arrester (shown with optional features).

terminals. When overvoltages occur, the VariSTAR arrester immediately limits the overvoltage to the required protective level by conducting only the necessary level of surge current to earth. Upon passage of the overvoltage condition, the arrester returns to its initial condition once again, conducting only minimal leakage current.

Arrester Type	UNS	UHS
System Application Voltages	3-36 kV	3-36 kV
Rated Arrester Voltages, $U_r$	3-36 kV	3-36 kV
Power System Frequency	50-60 Hz	50-60 Hz
Applicable Design and Test Standard	IEC 60099-4	IEC 60099-4
Nominal Discharge Current	5 kA	10 kA
Line Discharge Class	–	1
High Current Withstand	65 kA	100 kA
Pressure Relief Class	20 kA (rms Sym.) (B)	20 kA (rms Sym.) (B)
Maximum Energy, Square Wave (Repeatable 1 min)	1.83 kJ/kV $U_C$	2.85 kJ/kV $U_C$
High Current, Short Duration Energy Handling	(65 kA) 3.17 kJ/kV $U_C$	(100 kA) 3.9 kJ/kV $U_C$































