ZETRON®

DeadBolt

Lightning Surge Arrestor

INTRODUCTION

The DeadBolt is a five-stage surge arrestor for installation on a telephone line. The first and second stages are a pair of fusible resistors and a gas tube. Two standard, replaceable 3AG-type fuses form the third stage. The fourth stage is a solid-state, triple-balanced SIDAC circuit. The fifth stage is a radio frequency filter.

FEATURES

- **DeadBolt prevents destructive over-voltages, minimizing equipment failures, downtime and resulting revenue loss**
- **Plasma surge arrestor withstands repetitive surge currents up to 10,000 amps**
- **Fuses protect against sustained power line cross**
- **Fast-acting SIDAC circuit clamps to safe voltage level in a few nanoseconds**
- **Radio frequency filter suppresses line-related UHF and VHF interference**
- **With no MOVs to wear out, DeadBolt can survive repetitive strikes without repair or replacement**
- **Modular jack and screw terminals provide for equipment and line connection**
- **Easy-mount, rugged, weather resistant case with hinged cover**

APPLICATION

The DeadBolt protects valuable electronic equipment like Zetron interconnects from extremely fast-rising voltage transients and severe current surges due to lightning. The DeadBolt is connected between the phone line service entrance and the user's equipment or telephone. Due to the solid-state SIDAC circuit, the DeadBolt can withstand repetitive hits without performance degradation. Additionally, the DeadBolt suppresses UHF and VHF interference.

OPERATING CHARACTERISTICS

When either a line-to-line or line-to-ground voltage exceeds the breakdown voltage of the DeadBolt, it will clamp within nanoseconds to a safe voltage and remain clamped until the voltage returns to normal. If the abnormal voltage remains on the line (power line cross) then the fuses blow and disconnect the DeadBolt from the line. Fuse replacement should only be necessary in the event of a power line cross or a direct lightning strike.

CONSTRUCTION

The DeadBolt is constructed on a double sided PC board with extensive ground planes on both sides. The board is housed in a flame retardant, ultraviolet desensitized, ABS-KJU plastic case. The DeadBolt is shipped complete with 18-inch grounding cable, split-bolt grounding cable connector, extra fuses, and mounting screws.

GLOSSARY

Arc Voltage

The voltage drop across a gas tube surge arrestor while it is conducting in the arc mode.

Breakdown Voltage

The voltage at which a device changes from high impedance state to a low impedance state. Breakdown voltage may vary with the rate of rise of the applied voltage on some types of devices. The term is meaningful only if the rate of voltage rise (dV/dt) is specified.

Gas Tube Surge Arrestor

A device intended to limit voltage which contains two or more electrodes in an enclosed gas at or below atmospheric pressure. Gas tube surge arrestors are crowbar devices characterized by extremely high surge current ratings and low capacitance.

Holdover Voltage

The maximum DC voltage across the terminals of a gas tube surge arrestor under which it may be expected to extinguish and return to a high impedance state after the passage of a surge, under specified circuit conditions.

The most common specification in North America is 150 volts at 200 milliamps with a resistor-capacitor network connected in parallel with the surge arrestor to simulate the characteristics of the telephone line. This requirement is derived from the Rural Electrification Administration PE-80 specification. Many European specifications reference the requirements of CCITT, series K, which is similar, but do not provide for a resistor-capacitor network simulation of the telephone line.

Power Line Cross

The fault condition which occurs when a live AC power line comes in contact with a telephone line.

SIDAC

SIDAC is a silicon bilateral voltage triggered switch which is generally used as a shunt (crowbar) voltage limiter. Upon application of a voltage exceeding the SIDAC breakdown voltage, the SIDAC switches on through a negative resistance region to a low on-state-voltage. Conduction will continue until the current is interrupted or drops below the minimum holding current of the device.

SPECIFICATIONS

OPERATING

Longitudinal balance into 600 ohms (at 60 Hz)	-75 db max -80 db typical
Capacitance line-to-line	500 pf
Capacitance each line-to-ground	1000 pf
Insertion loss into 600 ohms	0.15 db
Ringing voltage RMS	140 volts max
Battery feed DC	60 volts max

GAS TUBE

Breakdown DC (dV/dt=500V/s)	500 volts max
Breakdown Pulse (dV/dt=100V/µs)max	800 volts max
DC Holdover Voltage (REA circuit)	150 volts/200 mA
Arc Voltage (I=5A)	20 volts

FUSES	Two 3AG-1A-fastblow Two fusible resistors

SIDAC CIRCUIT

Breakdown voltage line-to-line	300 volts
Breakdown voltage line-to-ground	300 volts
Breakdown current 60 Hz sine wave max	200 amp
Repetitive peak pulse current 10 X 160 µs	300 amp

RADIO FREQUENCY FILTER

Attenuation at 100 MHz	30 db
at 400 MHz	40 db

ENVIRONMENTAL

Storage temperature	-65 to +85°C
Operating temperature	-40 to +70°C
Humidity	10% to 90% non-condensing

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