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LIGHTNING ARRESTORS

P/N- F903, F903_24D

RINGLINE AND 24V LIGHTNING ARRESTORS

DESCRIPTION:

The Ringway F903 series of lightning arrestors provide a two stage protection for sensitive control equipment against lightning induced energies in connected field wiring. The interface provides both differential voltage protection across the field lines and common-mode protection of both lines to earth. Differential voltage is limited to a safe level (see Table 1) by combined action of the the TVS diode and gas discharge tube. The common-mode protection to earth is provided by the gas discharge tube. The gas discharge tube turns on when either line potential moves between 90 - 600V (depending on the rate of change of the transient) from earth and is capable of sinking up to 20kA for a very brief interval (around 20us). This common-mode protection to earth by the gas surge arrester guards the insulation (from earth) of the protected equipment. Under normal operating conditions the gas surge arrestor does not provide any impedance to earth (> 10GΩ). So the F903 board may be inserted without reducing the galvanic isolation of the system in real terms. The unit is provided complete with rail mounting support suitable for 'G' or 'H' rail. The F903 has a 71 x 50mm foot print.

NOTE: Using the F903 board does limit the ability of the field lines to float to very high common-mode voltages from earth potential as described in Ringway's technical paper 'Lightning Protection and Ringline'. While the ability of the field lines to float provides a credible means of lightning protection in itself, it exposes the isolation of the system power supply to damage in the event that the common mode surge voltage on the field wires is too great. The use of this board reduces the exposure of the power supply to common mode overvoltage by shunt protection.

FEATURES:

- Differential and Common-mode lightning/surge protection
- 9.4V version for Ringline installations
- 24V version for Industry standard power supply
- Other voltages available upon request
- Convenient G or H rail mounting

MODEL	WORKING VOLTAGE	CLAMP VOLTAGE (DIFFERENTIAL)
F903	9.4VDC (RINGLINE)	24V
F903_24D	24VDC	66V

Table 1: Nominal Clamp Voltages (Differential)

OPERATION:

When a high voltage transient appears across the fieldbus lines the TVS diode turns on very quickly (in nanoseconds) and limits voltage seen by control cards to the nominal clamp voltage (see Table 1). The gas discharge tube may take up to 5us to turn on and during this time the TVS diode dissipates a high power pulse. Once the gas discharge tube turns on it clamps voltage across the lines to between 20-70V and steers the high current transient back to the field. The gas discharge tube is rated to handle very high current levels - up to 20kA for 20us. After the transient has expired the gas tube returns to its high impedance state (>10Gohm from each line to earth).

BRIEF TECHNICAL SPECIFICATIONS:

Nominal Differential Working Voltage:

F903 : 9.4VDC (Ringline)

F903_24D : 24VDC

Nominal Differential Breakdown Voltage:

F903 : 11VDC (1mA)

F903_24D : 30VDC (1mA)

Nominal Differential Clamp Voltage:

F903 : 24VDC

F903_24D : 66VDC

Common Mode Impulse Sparkover Voltage:

550V typ, 600V pk +/- 20%

Common Mode Impulse Current:

20kA (8/20us pulse)

Operating Temperature Range:

-30 → +75 ºC

Dimensions:

71mm (L) x 50mm (W) x 35mm(H)*

* Height is from top of 'H' rail

TYPICAL INSTALLATION:

Figure 1 shows a typical installation of the F903 model protecting the Control equipment in a Ringline system.

NOTE: Earthed side to field wires. A 6-10mm^2 earth wire with the most direct route to ground is recommended.

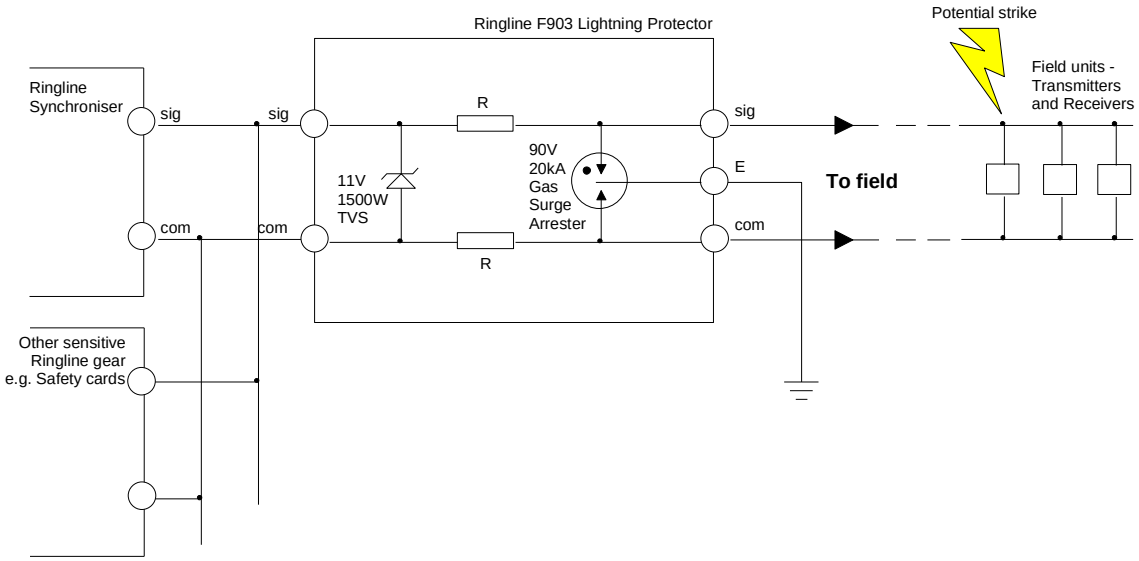

Figure 1: Typical F903 use in Ringline circuit