



## **TWICE Surge Suppression Specification**

### **How it Works...**

Surge protection using proper grounding (rods and plates) and Rain Master's TWICE Lightning Arrestors (TW-LA-1) provides the best possible protection against surge damage due to lightning or other electrical surge events. Conformance to this surge suppression specification is necessary to retain warranty protection under Rain Master's warranty terms.

Proper installation of grounding rods and wire connections are essential to providing good surge suppression. All installations should conform to manufacturer's instructions, and must meet or exceed the American Society of Irrigation Consultants (ASIC) Earth Grounding Guideline 100-2002. [http://www.asic.org/uploads/assets/011007\\_121320\\_ASIC\\_GROUNDING\\_GUIDELINES.doc](http://www.asic.org/uploads/assets/011007_121320_ASIC_GROUNDING_GUIDELINES.doc)

While no technology currently available can fully protect against damage from massive surges such as those caused by direct lightning strikes, outfitting your Rain Master TWICE system with surge grounding and surge protection as outlined in this document will protect your system from most if not all naturally occurring electrical surges. (Additional documentation may also be found on Rain Master's website ~ [www.rainmaster.com](http://www.rainmaster.com).)

### **Grounding Rods and Plates...**

In all cases where it does not conflict with appropriate grounding grid design for the site in question, Ground Rods or Plates as referred to in this specification shall conform to the following standards:

- 1) All grounding rods shall be bare copper of 5/8" diameter or greater, and 8' length or greater.
- 2) All grounding plates shall be 5 square feet, typically 4" by 96", as outlined in ASIC Earth Grounding Guideline 100-2002.
- 3) A measured resistance reading of no more than 25 ohms is necessary at each TW-LA-1 (Lightning Arrestor). ASIC Spec: Section 7.0 – Measuring resistance, item A.

Ground rods and plates shall be located at a minimum distance to assure that the two-wire path is outside of the electrode sphere of influence for the grounding rod. For an 8' grounding rod, this means that the grounding rod must be connected at least 8' away from the two-wire path, at a right angle to the two-wire path. See the section below for details on connecting the grounding rod or plate to the device or lightning arrestor. (Under no circumstance should a ground rod or ground plate be installed in or under a valve box, meter box or electrical box.)

### **Connections to Grounding Rods and Plates**

All connections to grounding rods shall conform to ASIC Earth Grounding Guideline 100-2002, and shall consist of either a Cadweld™ type or screw clamp type of connection. Cadweld or equivalent connections are preferred.

Any wire extensions required to connect from a grounding rod to a lightning arrestor or enclosure ground lug shall be bare copper, and shall not have any sharp bends or kinks. Wire extensions connected to lightning arrestors shall use a Cadweld type or screw clamp type connection where the bare copper ground wire meets the green grounding wire from the Lightning arrestor.

## Lightning Arrestors

TW-LA-1 Lightning Arrestors are a critical part of the surge protection scheme for both the TWICE two wire path and the backbone communication path.

A TW-LA-1 should be installed a minimum of every 600 ft along the two-wire path, in an appropriate irrigation box, and grounded accordingly (see Drawing 500545-A below). They should be connected to a two-wire cable that meets or exceeds Rain Master's TW-CAB-14 cable specification (See document # 500640-A at [http://www.rainmaster.com/twice\\_prod-lit.htm](http://www.rainmaster.com/twice_prod-lit.htm)) in accordance with the specification and grounding rod and plate guidelines above and diagramed below.

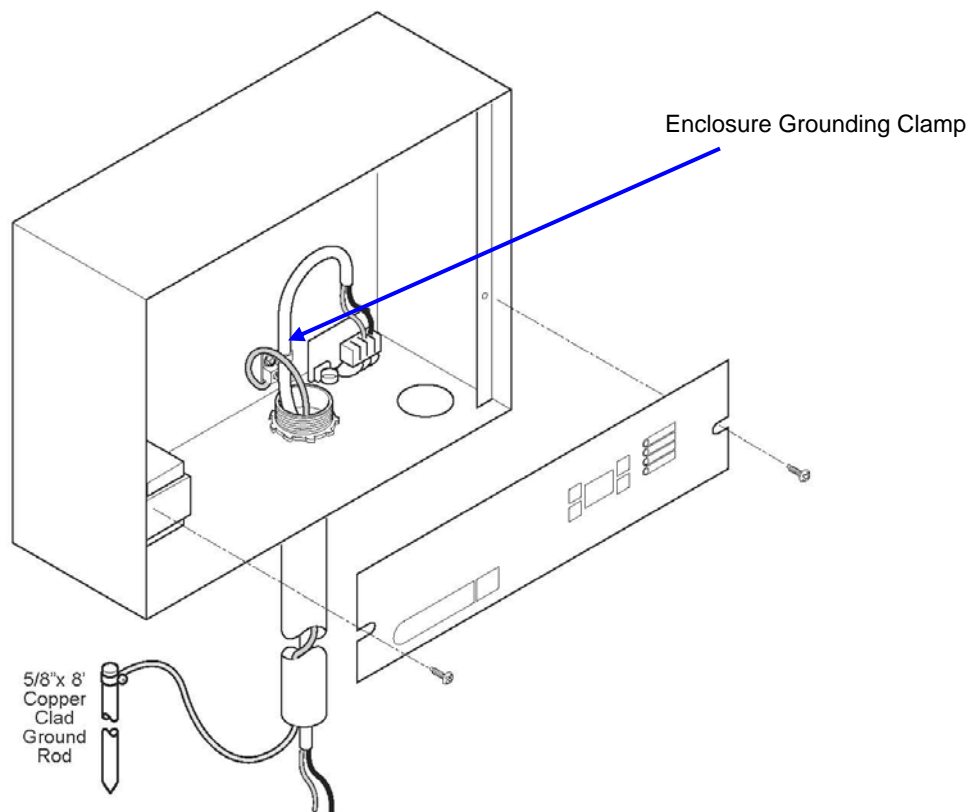
Lightning Arrestors should be connected to bare copper ground wires using screw clamp or Cadweld™ type connectors (wire nuts of any kind are not supported for grounding wires.)

Please review the two installation drawings below. Additional information and documentation may be found at [http://www.rainmaster.com/twice\\_prod-lit.htm](http://www.rainmaster.com/twice_prod-lit.htm)

### Controller Enclosure Grounding

Requires grounding to a single point of ground with 10 Ohms or less.

TWICE™ • TWO WIRE TERMINATION AT ENCLOSURE

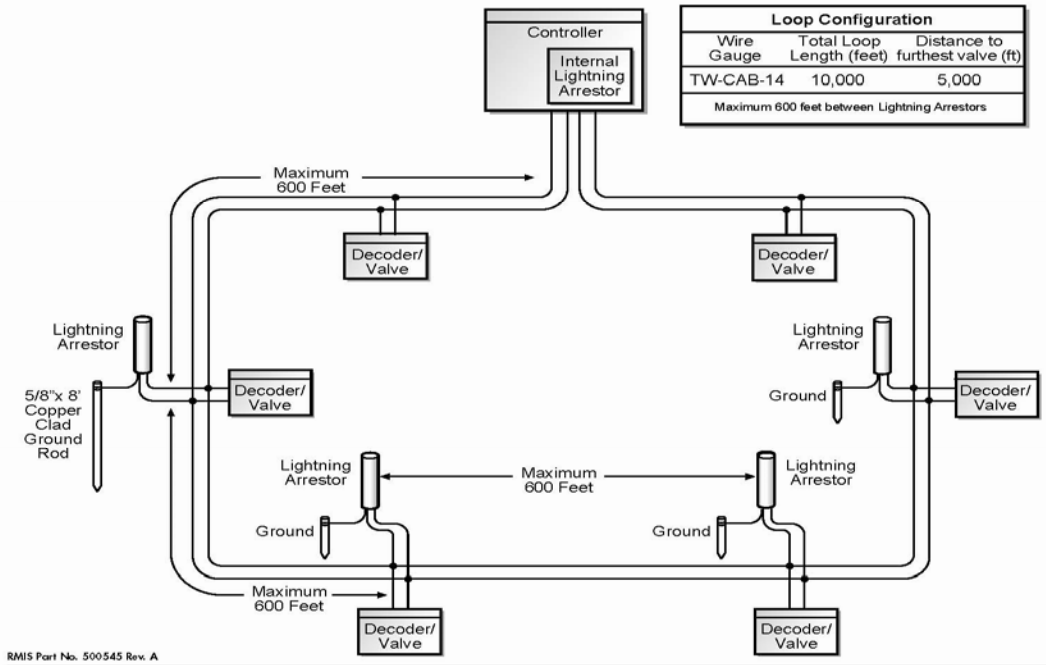


RMIS Part No. 500548 Rev. A

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**Drawing 500548-A**

TWICETM • LOOP CONFIGURATION

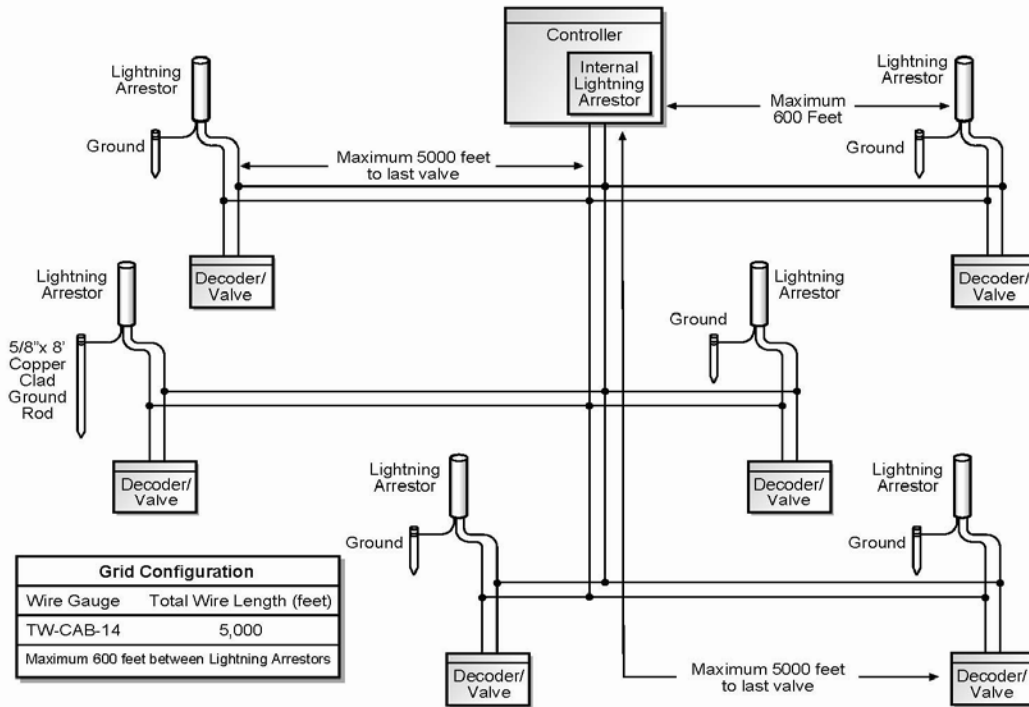


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**Drawing 500545-A**

TWICETM • GRID CONFIGURATION



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**Drawing 500546-A**

**Rain Master**  
 3910-B Royal Ave ~ Simi Valley, CA 93063  
 805-527-4498 ~ [www.rainmaster.com](http://www.rainmaster.com)