



# Installation Instructions

## OSMAC™ RDR Surge Protection Kits 91-1376 & 91-1455

### Introduction

Due to the unpredictable magnitude of high voltage transients caused by lightning, surge protection devices in general cannot control all power surge conditions. However, when properly installed and grounded, the surge protection module furnished in this kit will provide the maximum surge protection possible for the OSMAC RDR low voltage electronic components.

Installation of the surge protection kit is relatively easy due to its modular design and plug-in wiring harness. The only tools required are a medium phillips and a small common screwdriver. You will also need a power drill, a #32 (3 mm) drill bit and a center punch to provide mounting holes in the pedestal rear plate. A template is provided to ensure proper positioning of mounting holes.



**WARNING: DISCONNECT POWER TO CONTROLLER AT SOURCE. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY AND/OR EQUIPMENT DAMAGE.**

**AVERTISSEMENT: DEBANCHER LE SECTEUR ARRIVANT AU PROGRAMMATEUR. SI L' ON NE SE CONFORME SERIEUX DOMMAGES CORPORELS ET / OU MATERIAIS.**

**WARNUNG: TRENNEN SIE DIE STROMVERSORGUNG ZUM STEUERGERÄT AB. ANDERNFALLS KANN ES ZU ERNSTHAFTEN VERLETZUNGEN UND / ODER SCHÄDEN AN DEN GERÄTEN KOMMEN.**

### Installing Surge Protection Modules (Refer To Figure 1)

**Note:** The LTC pedestal with OSMAC adapter will accept up to three 91-1376 Station Module Kits and one 91-1455 Valve Common Module Kit. **Regardless of Station Module quantity installed, installation of one 91-1455 Valve Common Module kit is required.**

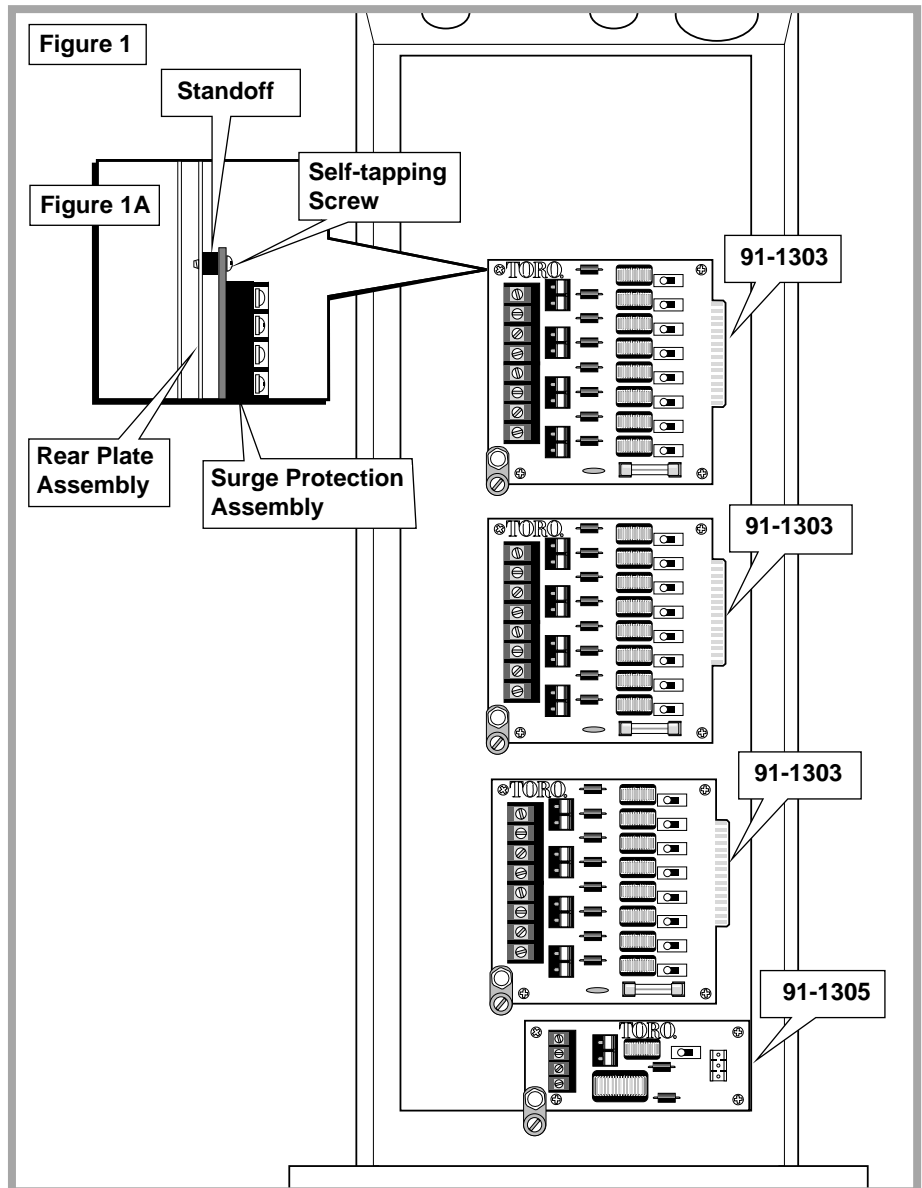
1. Unlock and remove pedestal cabinet door. Unlock and open RDR cover.
2. Label and identify all sprinkler valve wires (including valve common wires) connected to RDR unit. Remove wires from terminal blocks and temporarily position them outside of pedestal.
3. Unfold template provided and follow instructions printed on template to correctly locate and drill holes.
4. Install each module to rear plate using four self-tapping screws. Position standoffs between modules and rear plate as shown in Figure 1A.

### Installing Earth Ground

**A low resistance earth ground conductor must be connected to each surge protection module ground lug to enable operation of the surge protection devices.**

Ground conductor(s) with a total resistance of 10 Ohms or less must be installed within 12 ft. (3.6 m) of the surge protection devices. Use one or both of the following recommended grounding methods:

(continued on page 2)



- Drive one or more 5/8 in. (16 mm) by 8 ft. (2.5 m) copper clad steel rods into well moistened soil within 12 ft. (3.6 m) of pedestal.
- Bury one or more 1/8 in. x 1 ft. x 1-1/2 ft. (3 mm x 30.5 cm x 46 cm) copper plates in well compacted, moistened soil within 12 ft. (3.6 m) of pedestal.

1. Using an earth resistance testing instrument,\* measure resistance of ground conductor(s). To calculate total resistance (Rt) of multiple ground conductors, use the following formula:

$R_t = 1.1 (R_m/n)$ <p>where: R<sub>m</sub> = average conductor resistance n = number of ground conductors</p>
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\*Megger Direct Reading Earth Resistance Testing Instrument, James G. Biddle Co., Plymouth Meeting, PA, U.S.A.

2. Clamp five separate lengths of 6 AWG non-insulated copper wire to ground conductor(s). Route wires into pedestal through field wire conduit. Connect a separate wire to RDR system ground lug and each surge protection module ground lug as shown in **Figure 2**.

**Note:** Ground wires should be routed to ground lugs in the most direct route using the slightest bends possible. In addition, the ground wires should not be touching other wires, components or pedestal surfaces.

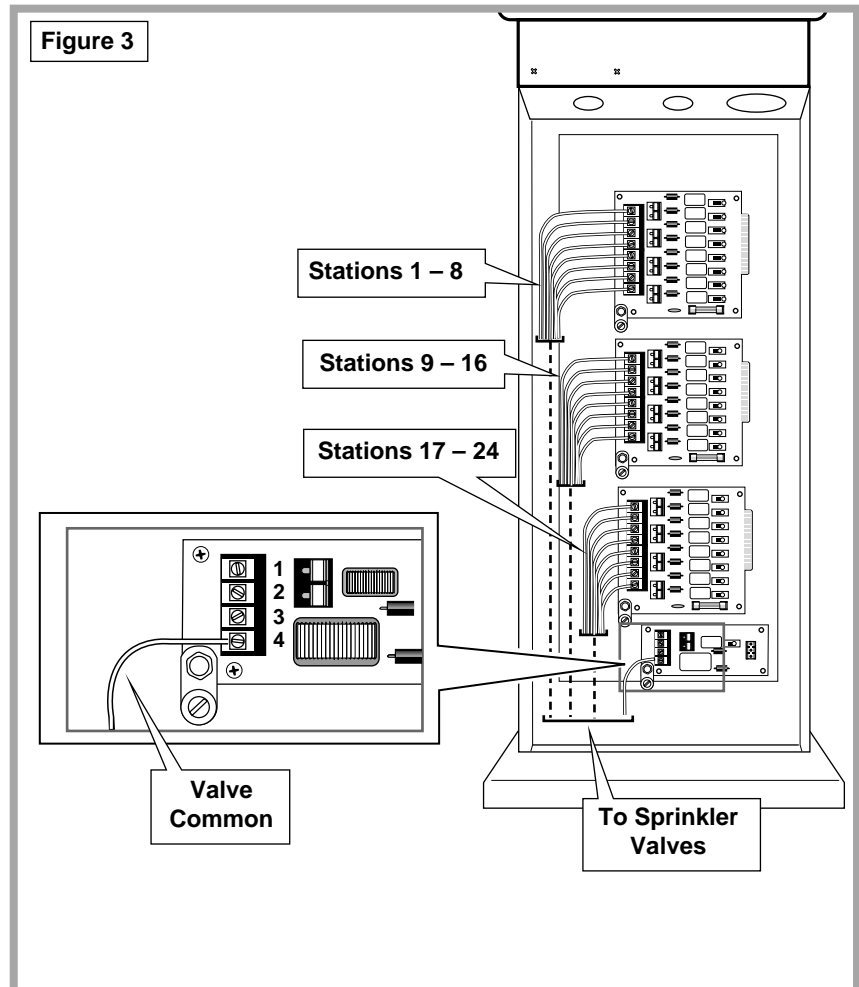
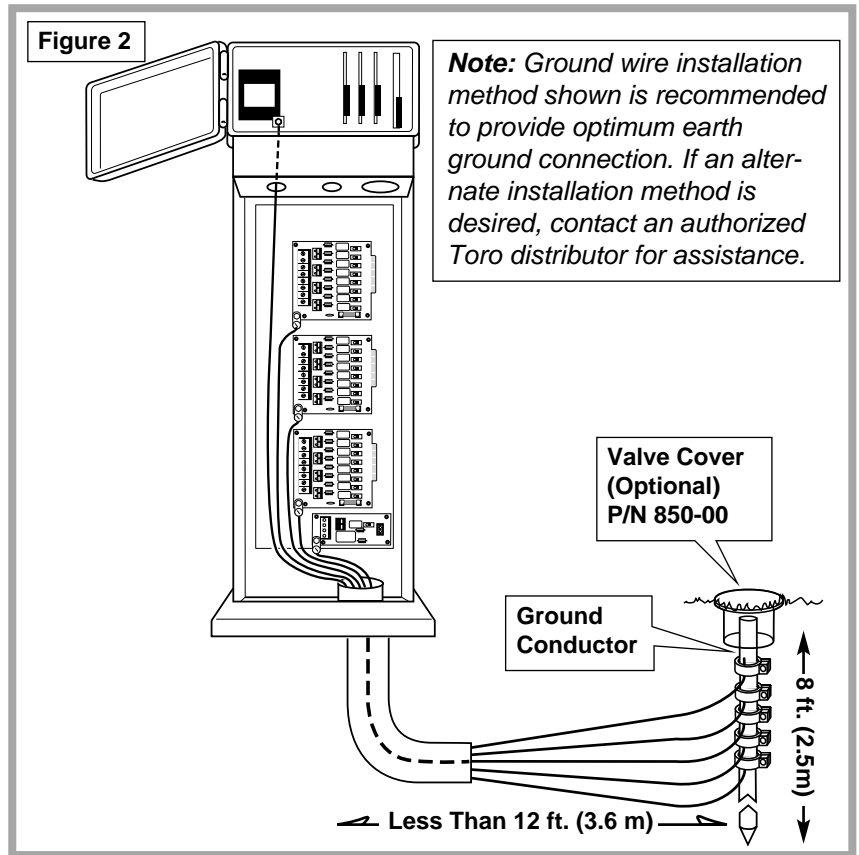
### Installing Valve Control Wiring

(Refer To **Figure 4**)

1. Route valve control wires 1 – 8 to top Station Module and connect to appropriate terminals 1 – 8. Route valve wires 9 – 16 to second Station Module. Connect valve wire 9 to terminal 1, wire 10 to terminal 2, etc. until all valve control wires are connected. Route valve wires 17 – 24 to third Station Module. Connect valve wire 17 to terminal 1, wire 18 to terminal 2, etc. until all valve control wires are connected.

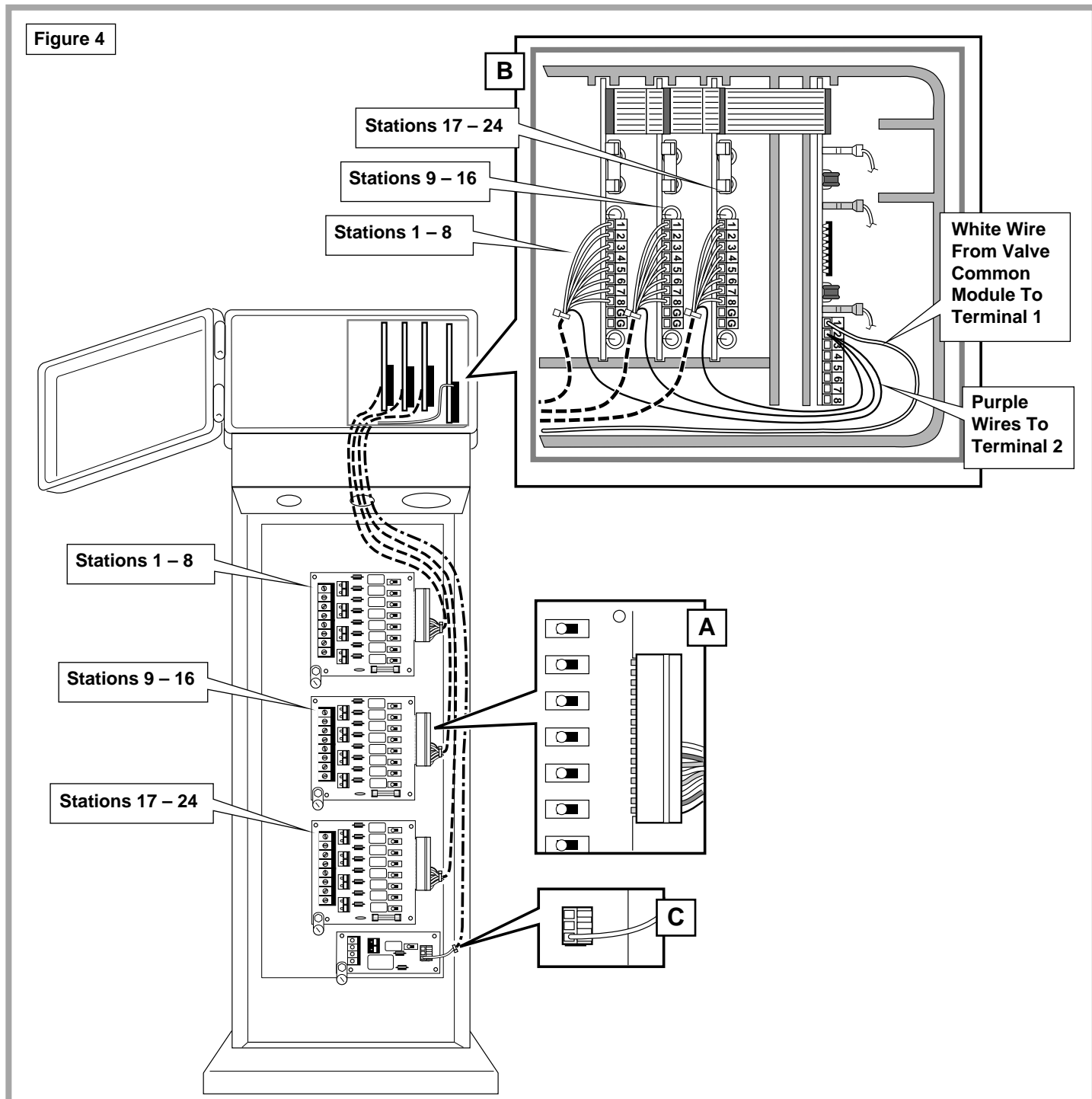
2. Route valve common wire(s) to Valve Common Module; connect to terminal 4.

**Note:** Valve Common Module can accommodate two additional valve common wires on terminals 2 and/or 3 if needed.



## Attaching Cable Harness (Refer To Figure 4)

1. Attach 9-wire harness connector to selected 91-1303 Station Module. (*Connector is correctly oriented with stepped side facing toward front of pedestal*). See **Detail A**.
2. Route wires from Station Module into RDR housing through center conduit opening. Attach (numbered) station wires to appropriate terminals **1 – 8** on triac output card. Repeat this procedure for all Station Modules being installed. See **Detail B**.
3. Route all 22 AWG Purple wires (one from each wiring harness assembly) to Rec/Dec card location. Connect Purple wires to terminal **2**. See **Detail B**.
4. Plug wire harness connector into receptacle on Valve Common Module. (*Plug is correctly oriented with White wire to "Com"*). Route White wire into RDR and connect to Rec/Dec terminal **1**. See **Detail C**.



## Selecting Operating Mode

(Refer To **Figure 5**)

The 91-0130 Station Module incorporates slide switches which enable three operating modes to be selected for each valve station. Set switches to appropriate position as follows:

- **AUTO** position enables the valve station circuit to function automatically per controller operation.
- **OFF** position disables the station until the switch is moved to AUTO or ON.
- **ON** position manually activates the station circuit until the switch is moved to AUTO or OFF.

## Service Components

(Refer To **Figure 6**)

**Surge Devices** – The surge protection modules utilize replaceable, clip-mounted surge protection devices for each station and common circuit. The surge protection devices installed are quick reaction, gas ionization type, commonly called “surge pills”, which momentarily shunt high voltage directly to earth ground. Depending on the frequency and severity of lightning strikes incurred, the “surge pills” can generally withstand several high voltage surges before malfunction occurs. To ensure proper “surge pill” condition, a periodic test schedule should be established and maintained. Contact an authorized Toro distributor for service assistance. See **Detail A** for proper insertion of “surge pill” into retention device.

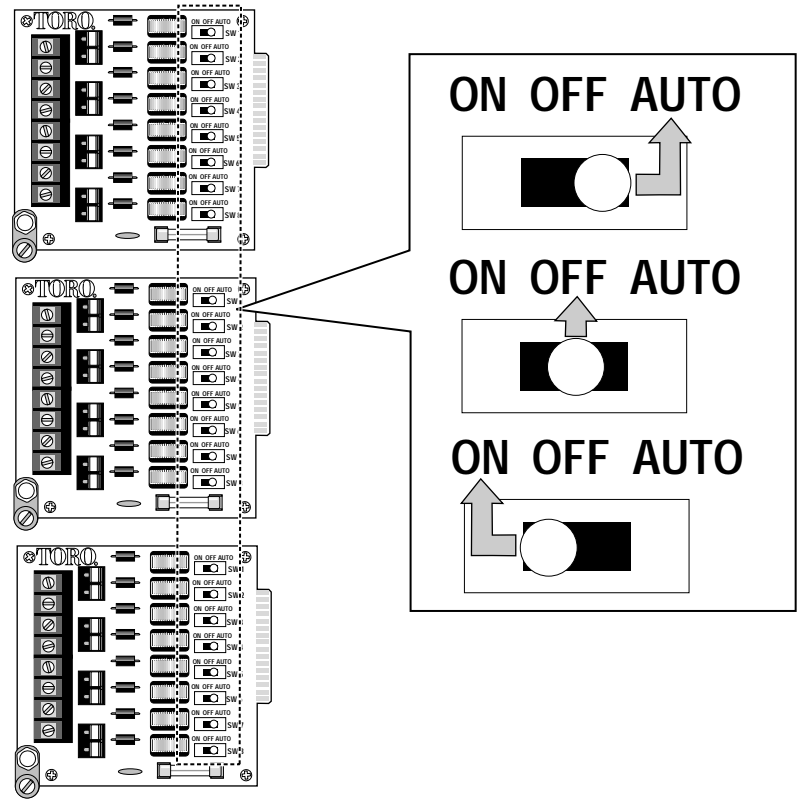
**Fuses** – Slow blow fuses are utilized on the Station Modules for additional circuit protection. If fuse replacement is required, always use the same type and rating as originally installed by the factory.

**CAUTION:** Never install a replacement fuse with a higher amperage rating. Severe damage can result.

**ATTENTION:** Ne jamais remplacer un fusible par un fusible d'un amperage de valeur supérieure. Il pourrait en résulter des dommages importants.

**ACHTUNG:** Setzen Sie niemals eine Ersatzsicherung mit einem größeren Amperwert, als dem originalen ein.

**Figure 5**



**Figure 6**

