



# Installation Instructions

## Network 8000™ Satellite Controller

### Version 5.0 and Later

#### Introduction

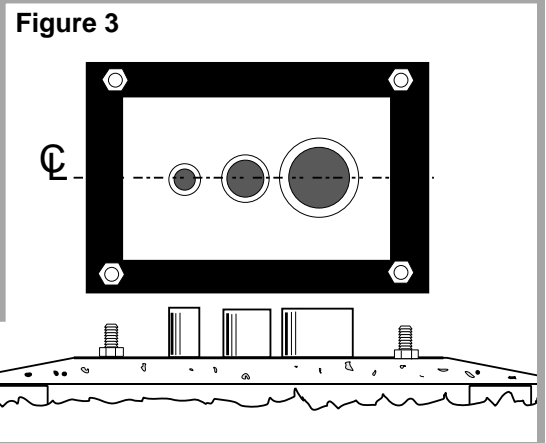
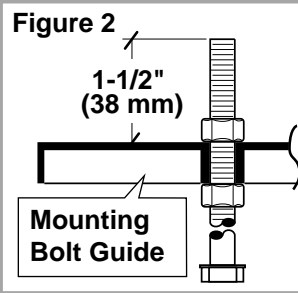
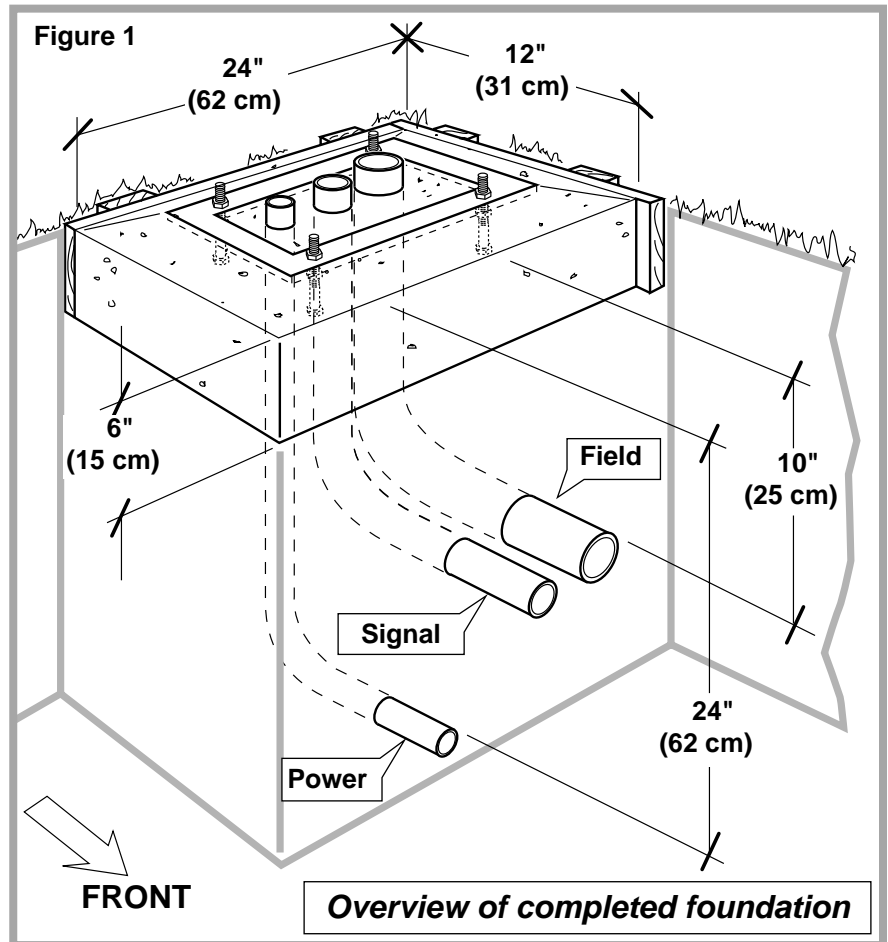
The Network 8000™ satellite controller is designed for installation on a specially prepared concrete foundation. A mounting bolt positioner and basic mounting hardware components are included with each controller. Reviewing the instructions completely before starting the installation will enable you to determine the additional materials and tools required to complete the installation.

**For your protection and the safety of the user, please abide by all Caution and Warning statements within this document. Assure all installation practices comply with all applicable electrical and construction codes for the area.**

#### Installing Pedestal Cabinet

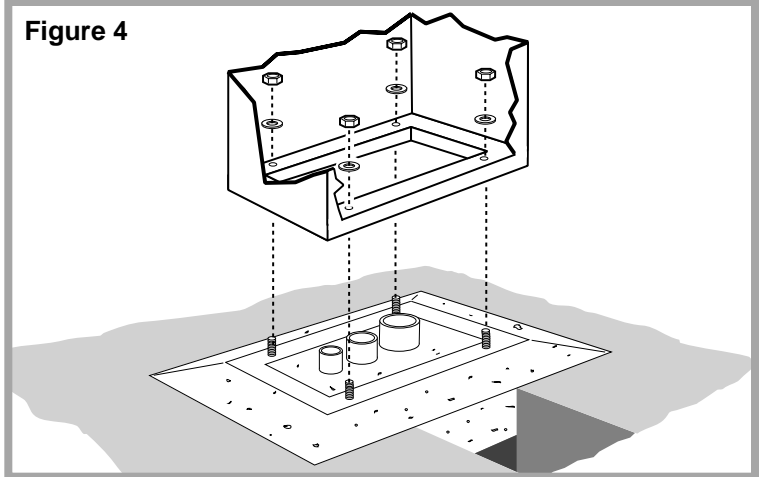
The pedestal mount cabinet requires a concrete foundation for proper support and sweep ell conduit for wiring access. A mounting bolt guide is provided for proper bolt placement in foundation.

1. To avoid the possibility of lightning strikes, select an installation site in which the controller will not be the highest object in the general vicinity.
2. Prepare a hole for foundation and conduit approximately 24" W x 12" L x 24" D (62 cm W x 31 cm L x 61 cm D). See **Figure 1**.
3. Prepare a connecting trench to route power, field and signal wires.
4. Position 1/2", 1" and 3" sweep elbow conduit sections in hole as shown. Cover conduit ends with tape to seal out dirt and debris. Backfill soil to about 6" (15 cm) below finish grade level.
5. For enhanced installation appearance, prepare sides of foundation hole with wooden forms.
6. Secure 5/16 x 4-1/2" bolts and 5/16 -18 hex nuts supplied to mounting bolt guide as shown in **Figure 2**. Threaded end of bolts should protrude 1-1/2" (38 mm) from top surface of guide.
7. Pour concrete into hole and smooth with trowel.
8. Press mounting bolt guide into concrete until flush and level. Center guide with conduit as shown to prevent pedestal/conduit interference. See **Figure 3**.
9. To prevent pooling at base of pedestal, finish foundation with gradual slope away from bolt guide. Allow concrete to sufficiently harden before continuing.



10. Remove hex nuts from mounting studs.
11. Unlock and remove pedestal cover(s). Position pedestal on foundation with studs protruding through holes in base. Install a flat washer and hex nut on each stud and tighten securely. **See Figure 4.**

**Figure 4**



### Connecting Field Wiring

1. Route control and common wires to valve or valve-in-head sprinkler locations. See Wire Sizing Chart in **Table 1** for proper wire size application.
2. Attach control and common wires to solenoid leads using an approved waterproof splicing method. Label each control wire to enable identification at controller installation site. Route wires into controller cabinet through 3" sweep elbow conduit.

**Note:** Connecting more than three 0.21 Amp valve loads per station is not recommended. If valve current rating is unknown, contact an authorized Toro representative for assistance prior to making this type of connection.

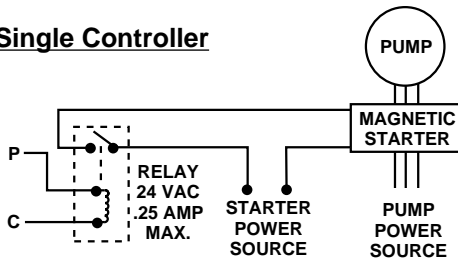
3. If automatic pump start is required, refer to applicable wiring diagram in **Figure 5** and install accordingly.

**Table 1 - Wire Sizing Chart**

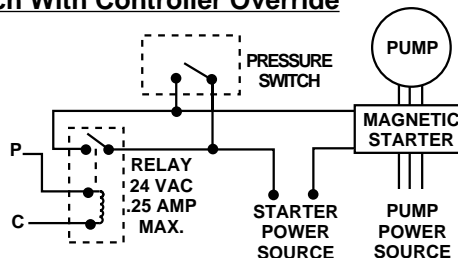
VOLTAGE AT CONTROLLER	WIRE SIZE		NUMBER OF VALVES/MAX. WIRE LENGTH					
	CONTROL	COMMON	Feet			Meters		
			1	2	3	1	2	3
110 VAC	14	14	2348	1012	549	716	308	167
110 VAC	14	12	2890	1239	673	881	378	205
110 VAC	14	10	3378	1448	786	1030	441	240
110 VAC	12	12	3759	1604	873	1146	489	266
110 VAC	12	10	4591	1973	1071	1399	601	326
110 VAC	12	8	5411	2328	1263	1649	710	385
110 VAC	10	10	5945	2555	1387	1812	779	423
115 VAC	14	14	2765	1309	846	843	399	258
115 VAC	14	12	3393	1608	1039	1034	490	317
115 VAC	14	10	3962	1877	1213	1208	572	370
115 VAC	12	12	4394	2082	1346	1339	635	410
115 VAC	12	10	5397	2557	1652	1645	779	504
115 VAC	12	8	6364	3018	1949	1940	920	594
115 VAC	10	10	6986	3311	2140	2129	1009	652

**Figure 5**

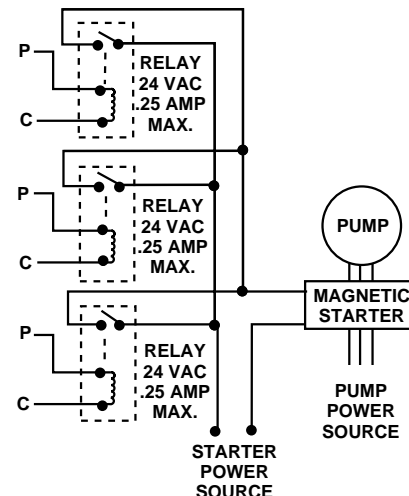
#### Single Controller



#### Pressure Switch With Controller Override

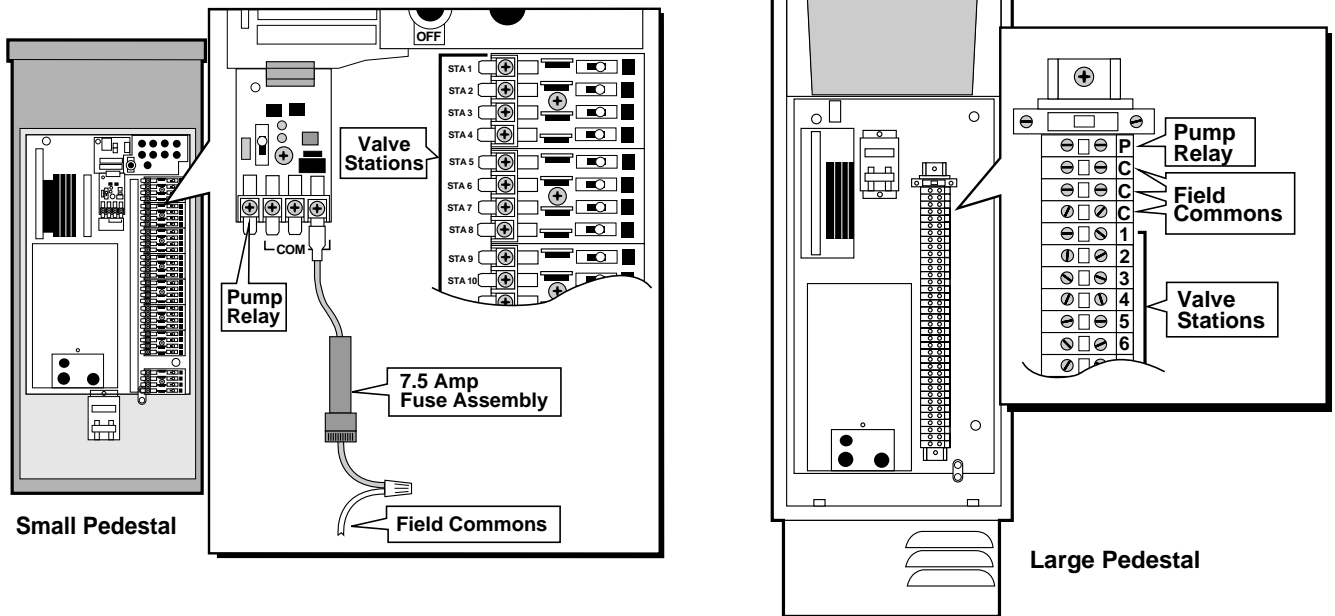


#### Multiple Controllers



4. Referring to **Figure 6** below, secure valve control wires to valve station terminals 1 – 32 in preferred operating sequence.
- Small Pedestal** – Install 7.5 Amp fuse assembly (supplied) to COM terminal of pump triac/current monitoring assembly. Using wire nut supplied, attach field common wires to fuse assembly. Secure pump relay to PUMP terminal
- Large Pedestal** – Secure field common wires to common terminals (C) and pump relay to pump terminal (P).

**Figure 6**



**Installing Earth Ground**

A low resistance earth ground conductor must be connected to the controller chassis ground lug to enable operation of the built-in surge protection devices. A ground conductor (or conductors) with total resistance of 10 Ohms or less must be installed within 12' (3.6 m) of each controller installation site. Use one or both of the following recommended methods to achieve proper grounding:

- Drive one or more 5/8" x 8' (16 mm x 2.5 m) copper clad steel rods into well moistened soil 12' (3.6 m) or less from controller.
- Bury one or more 1/8" x 1' x 1-1/2' (3 mm x 30.5 cm x 46 cm) copper plates in well compacted, moistened soil 12' (3.6 m) or less from controller.

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

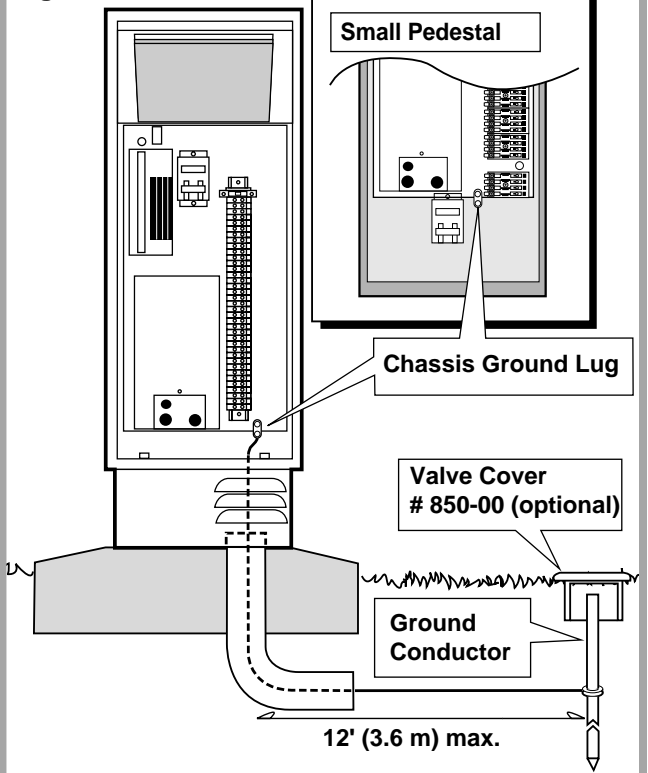
$$R_t = 1.1 (R_m/n)$$

where: R<sub>m</sub> = average single conductor resistance  
 n = number of ground conductors

Secure a length of 6 AWG non-insulated copper wire to ground conductor(s). Route wire into controller through field wire conduit and connect to cabinet ground lug. See **Figure 7**.

\* Megger Direct Reading Earth Resistance Testing Instrument, James G. Biddle Company, Plymouth Meeting, PA, U.S.A.

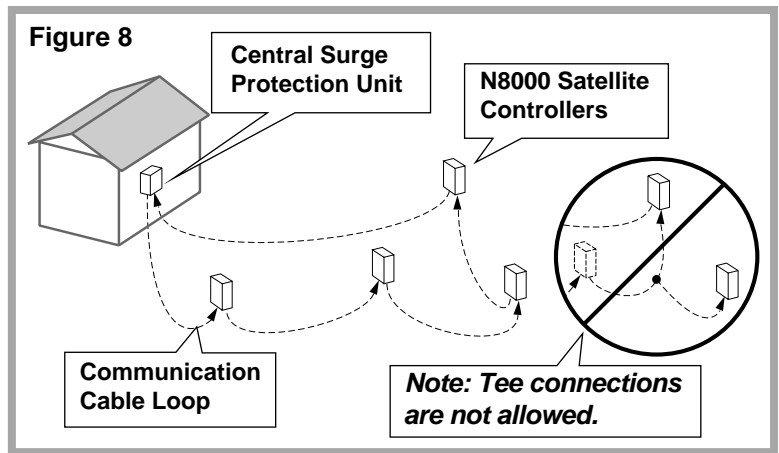
**Figure 7**



**WARNING**  
 NEVER CONNECT AC COMMON OR FIELD COMMON TO EARTH GROUND. THIS ACTION WILL DEFEAT THE BUILT-IN SURGE PROTECTION DEVICES RESULTING IN POSSIBLE INJURY AND OR EQUIPMENT DAMAGE DUE TO LIGHTNING STRIKE.

## Installing Signal Cable

The signal cable provides a communications pathway for two-way data transmission between the central and satellite controllers. Correct installation of the cable is critical for proper operation of the Network system. As illustrated in **Figure 8**, the signal cable run forms an unbroken loop that starts and ends at the Network SPU and is installed *without tee connections* to all satellites in a designated communications path (Comm Path 1 and/or Comm Path 2). The Network system components are designed for use with jacketed, armored, shielded, 16 AWG twisted pair cable (available from Paige Electric Company, part # 7162D - A ).

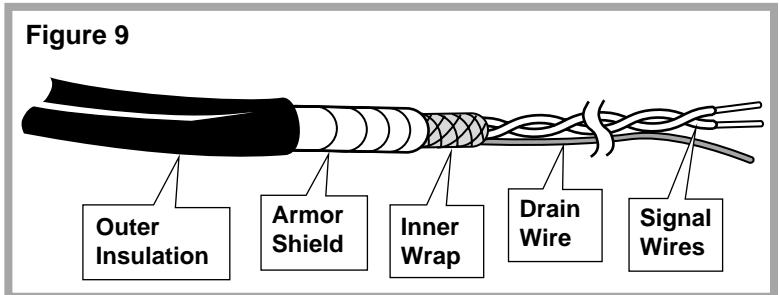


- Starting at SPU, route signal cable into each satellite cabinet within the communications path. To facilitate connection to satellite, provide a 6' (1.8 m) cable loop at each green pedestal location or a 10' (3 m) cable loop at each stainless pedestal location. At SPU, label each end of signal cable loop for future identification.



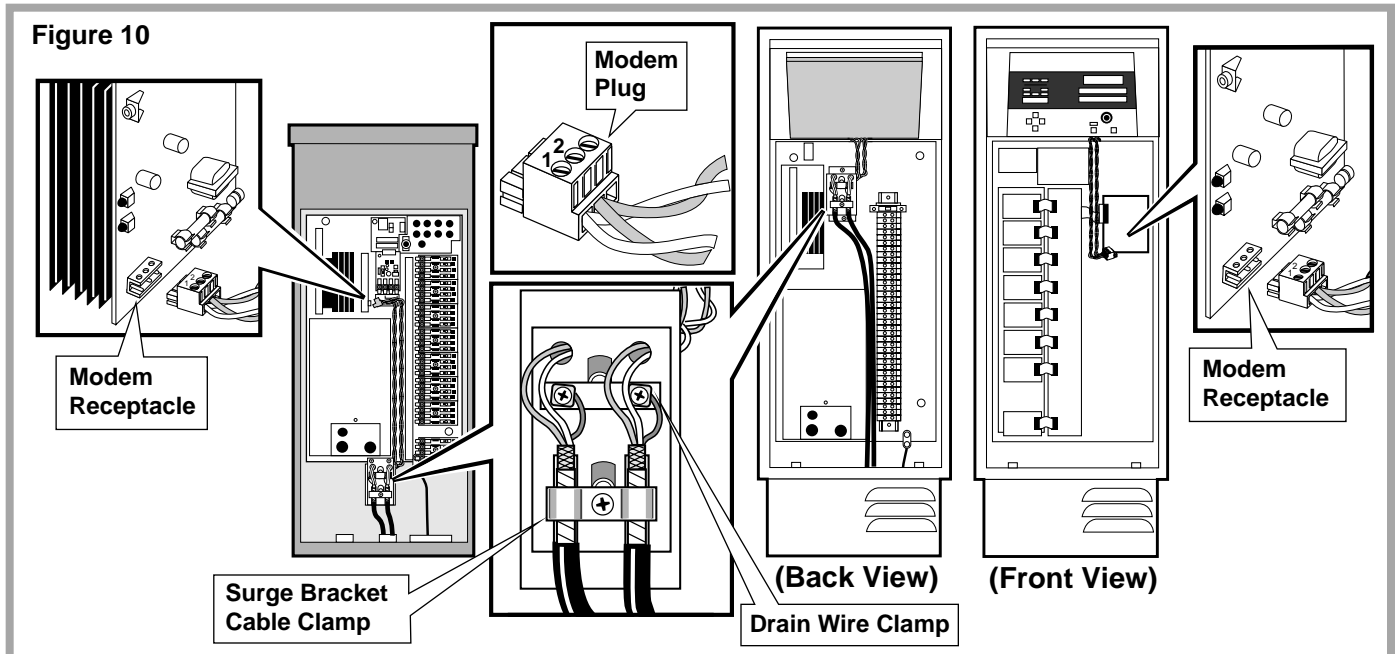
**WARNING**  
**STAINLESS STEEL ARMOR WRAP IS VERY SHARP AND MAY BE HAZARDOUS IF NOT HANDLED PROPERLY. TO PREVENT INJURY, WEAR GLOVES AND USE EXTREME CARE WHEN WORKING WITH THIS MATERIAL.**

- Prepare signal cable for connection to satellite as follows: Cut cable at center of loop. From each length of cable, remove 2' (61 cm) of outer insulation. Carefully remove stainless steel armor shield leaving approximately 1" (26 mm) of armor extending past outer insulation. See WARNING above. Remove inner wrap leaving approximately 1/2" (13 mm) extending past armor shield. Remove 3/8" (10 mm) of insulation from ends of signal wires. See **Figure 9**.



- Secure signal cables to cable bracket assembly. Assure armor shield is secured under cable clamp. Attach drain wires to drain wire clamps. Using a small blade screwdriver, attach signal wires to modem plug as follows: Yellow wires to position 1; Gray wires to position 2. See **Figure 10** below.

**Note:** Modem plugs should not be connected to the SPU or satellite modem receptacle until proper signal cable installation has been verified. Refer to installation instructions furnished with central system components for detailed signal cable testing procedures.



## Connecting Power and Equipment Ground Wires



### WARNING

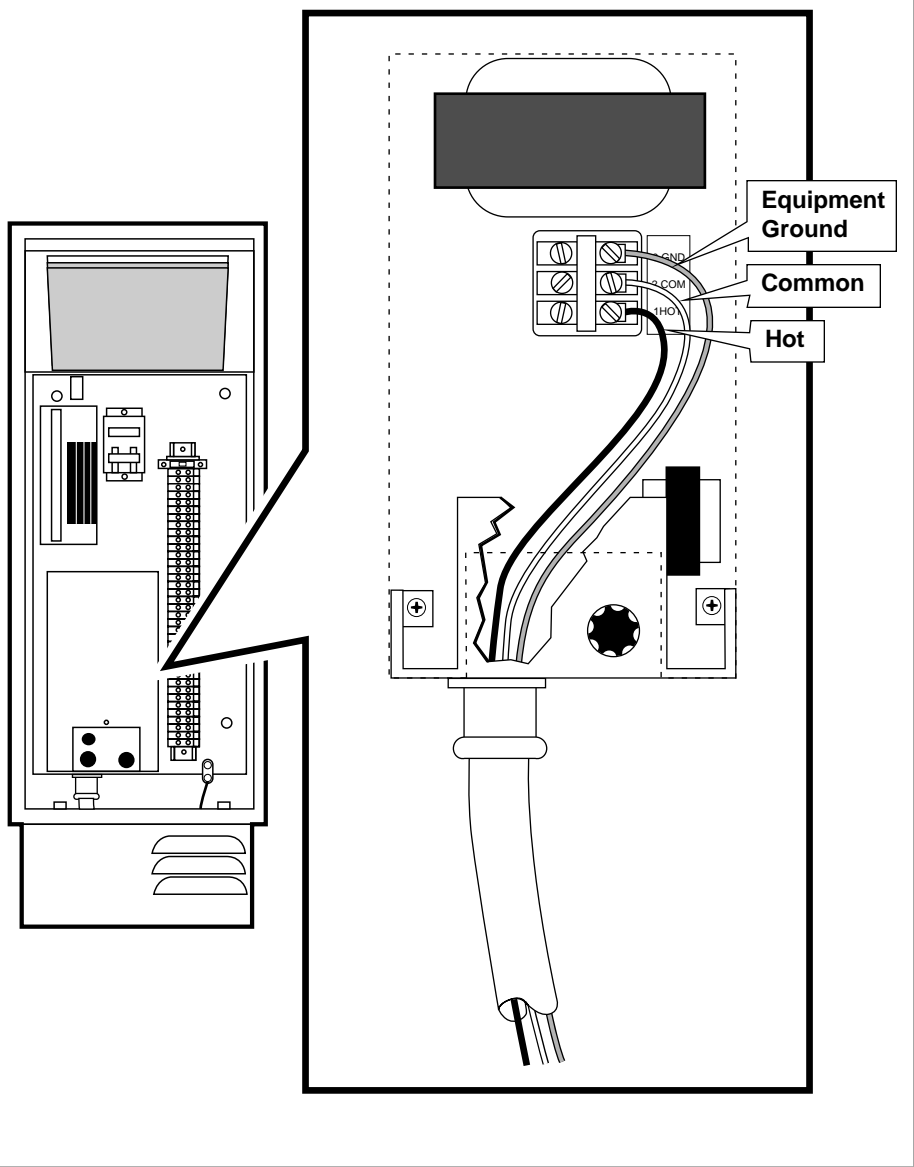
THE NETWORK 8000 CONTROLLER OPERATES ON 120 VAC 60 HZ POWER. APPLICATION OF A HIGHER VOLTAGE WILL DAMAGE THE CONTROLLER AND CAUSE AN ELECTRICAL HAZARD WHICH MAY RESULT IN INJURY AND/OR EQUIPMENT DAMAGE. ELECTRICAL CONNECTIONS MUST BE MADE IN COMPLIANCE WITH ALL APPLICABLE ELECTRICAL CODES. ASSURE POWER SOURCE IS OFF PRIOR TO MAKING ANY ELECTRICAL CONNECTIONS TO CONTROLLER.

1. Remove AC power compartment cover (retained by single phillips screw).
2. Install 1/2" electrical conduit from sweep ell in concrete foundation to conduit access hole provided in lower power compartment bracket.
3. Route 120 VAC Power, Common (neutral) and Equipment Ground wires from power source through conduit into power compartment. Secure wires to three position terminal block as follows: Equipment Ground to #3 GND, Common to #2 COM, and 120 VAC Power to #1 HOT.

**CAUTION: Proper polarity must be strictly observed when connecting power wires to controllers. Reversed polarity may cause damaging potentials to exist at one or more controller locations.**

4. Install and secure power compartment cover.
5. Apply power to controller at source. See User's Guide form # 367-0087.

Figure 11



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