



Network 8000[®] Satellite Controller

Plastic Cabinet Models

Installation Instructions

Introduction

The Network 8000 satellite controller is designed for installation on a substantial concrete foundation with imbedded conduit of various diameters to enable power, field, ground and communication wiring to be routed into the cabinet for connection. A mounting bolt positioner and basic mounting hardware components are included with each controller. Additional materials required to complete the installation must be obtained separately. A material list can be compiled by reading through the instructions completely prior to starting the installation.

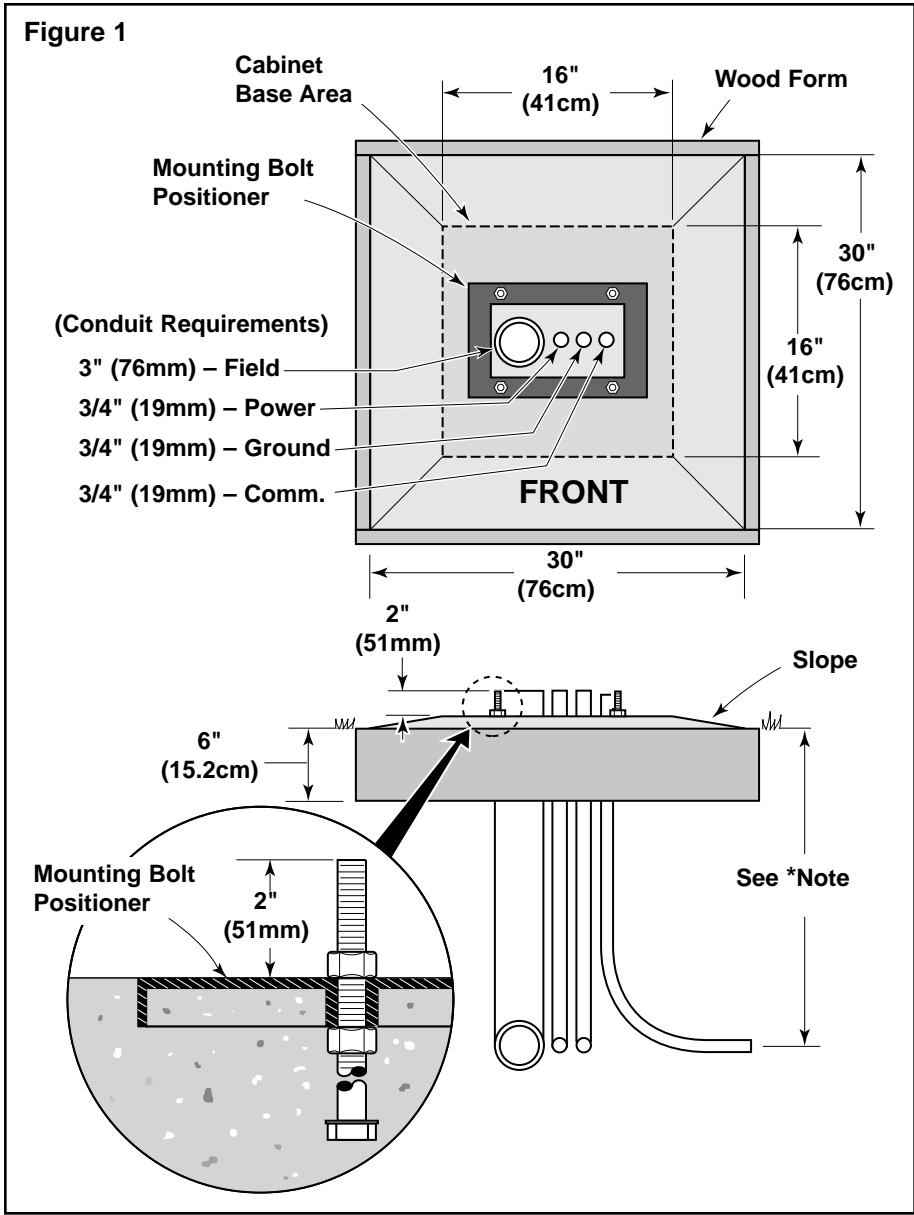
For your protection and the safety of the product user, comply with all Caution and Warning statements within this document. All installation practices must comply with all applicable national and/or local electrical and construction codes.

Foundation Construction

1. Prepare a hole for the foundation and wiring conduit using the recommended dimensions shown in **Figure 1**.

***Note:** Refer to local electrical codes for required depth of buried wiring .

2. Trench to the foundation site as required for each wiring run.
3. Position straight and sweep elbow conduit sections in foundation hole as shown. Tape the conduit ends to seal out dirt. Backfill soil to form a 6" (15.2cm) foundation depth. Conduit should not extend more than 2" (51mm) above the finished top surface of the foundation.
4. Prepare the sides of the foundation hole with wood forms.
5. Prepare the mounting bolt positioner with the 5/16 x 4-1/2" bolts and nuts (provided) as shown in **Figure 1**. The threads should extend 2" (51mm) from the top surface of the bolt positioner.
6. Pour concrete into the formed foundation hole. Press the mounting bolt positioner into the concrete until it is flush and level with the foundation surface and aligned with the conduit.
7. Finish the concrete with a level flat area for the pedestal base. To prevent pooling at the base of the pedestal, add a slight taper away from the cabinet base contact area. Allow concrete to sufficiently harden before continuing.



8. Remove the hex nuts from the mounting studs. Carefully position the controller onto the studs. Install a flat washer and a hex nut on each stud and tighten securely.

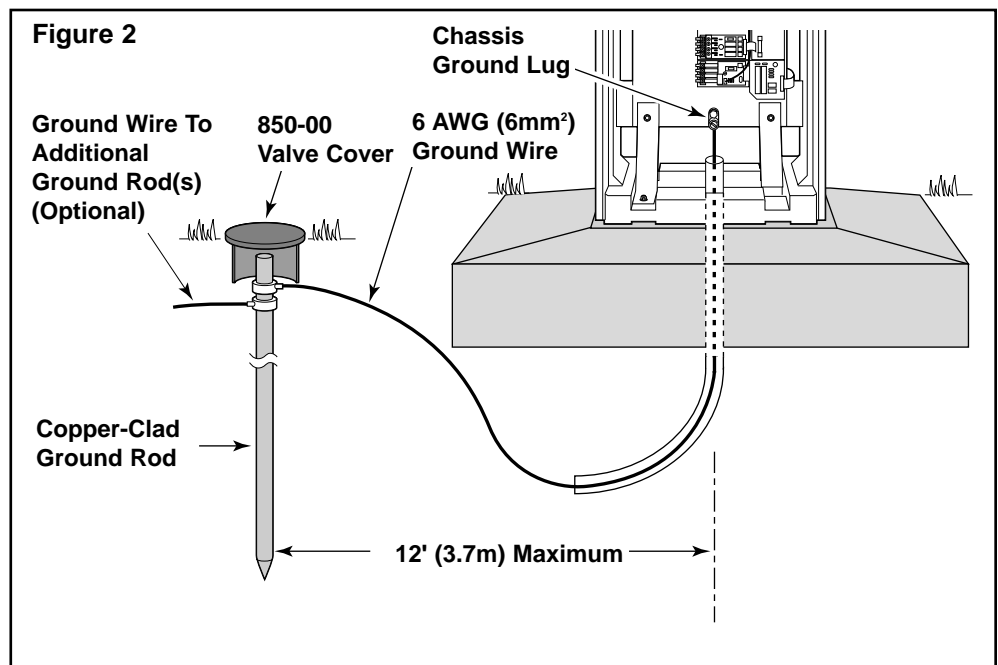
Earth Ground Installation

Note: The satellite surge protection components cannot properly function unless an efficient pathway to earth ground is provided. The ground path must be as direct as possible, without sharp bends and should have 10 ohms or less resistance (when measured with an earth ground resistance test device). For optimum ground protection, all electrical components throughout the irrigation system should be grounded in a manner which provides the same ground potential.

The following instructions depict one of several recommended grounding methods. Due to variables in soil composition and terrain, the method shown may not be suitable for your installation site. Contact your local Toro distributor for alternate grounding methods and availability of the required earth ground resistance test instrument. Recommended ground testers are: AEMC Instruments, model 3710 clamp-on tester, or Biddle Megger, model 250260 (or equivalent).

Procedure

1. Drive a 5/8" (16mm) by 8' (2.5m) copper-clad steel rod into well-moistened soil not more than 12' (3.7m) from the satellite. The top of the ground rod should be slightly below grade level.
2. Using a 5/8" (16mm) clamp or "Cad weld" fastener, attach a length of 6 AWG (6mm²) solid-core, bare copper wire near the top of the ground rod. Avoiding sharp bends, route the wire through the foundation into the controller cabinet. Secure the wire to the large copper ground lug provided on the power supply chassis. See **Figure 2**.
3. Ensure the soil surrounding the ground rod remains well moistened. Measure the ground resistance per the instructions provided with the ground test instrument. A reading of 10 ohms or less is optimum. A reading of 11–30 ohms offers good grounding protection. If the resistance exceeds the acceptable limit, an additional ground rod can be installed at a distance equal to twice the buried depth of the first rod (i.e., 16' [4.9m]). Connect the ground rods using 6 AWG (6mm²) bare copper wire and test again. If the ground resistance remains high, contact your local Toro distributor for further assistance and recommendations.



Note: A Toro Valve Cover, P/N 850-00, works well for covering the ground rod and providing access to the ground wire connection(s).

Communication Cable Installation

Please note the following communication cable installation requirements and suggestions:

- The satellite is designed for use with shielded, twisted-pair, communication cable. Consult with your local Toro distributor for the cable type and wire size best suited for your installation.
- If the communication cable is routed in the same trench as main power wires, a minimum of 12" (30.5cm) separation is recommended to prevent voltage induction on the communication cable. Check local codes for actual requirements.
- Refer to the installation instructions provided with the central control system for communication cable testing procedures.
- If in-ground cable splices or repairs are required, the connection must be properly insulated with a waterproof splicing device. Using an appropriate splicing kit, such as Scotchcast 82-A1 (or equivalent), is recommended. Placing the cable splice in a small valve box for protection and accessibility is also recognized as good installation practice.

Procedure

1. Starting at the SPU, route the communication (comm) cable to each satellite location. See **Figure 3**.

Note: Leave a 10' (3.5m) service loop of cable at each satellite.

2. At the satellite, cut the cable and pull both ends into the satellite through the 3/4" (16mm) sweep conduit.

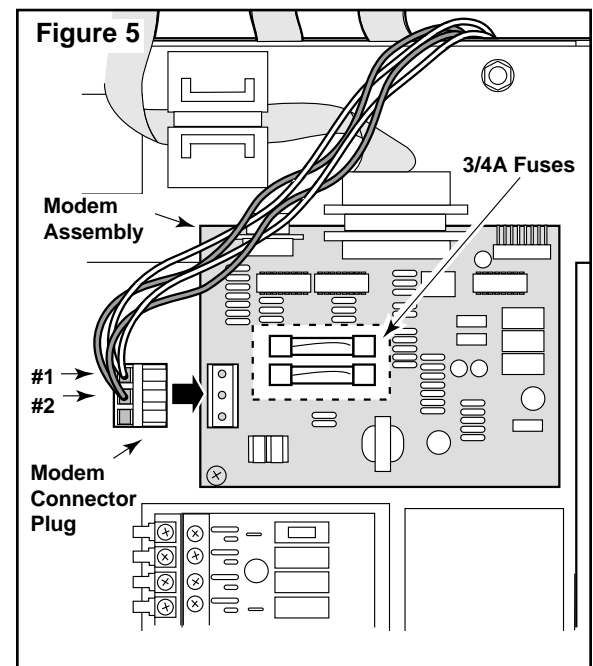
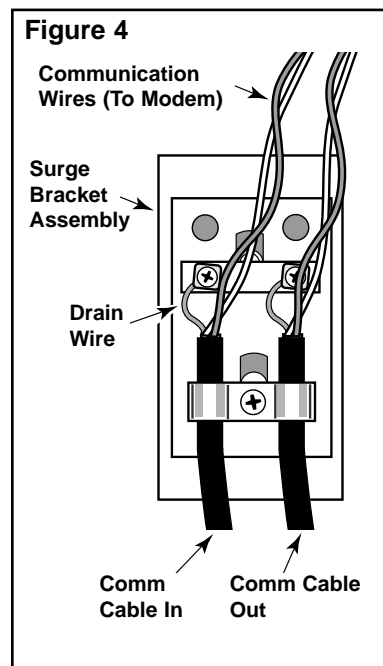
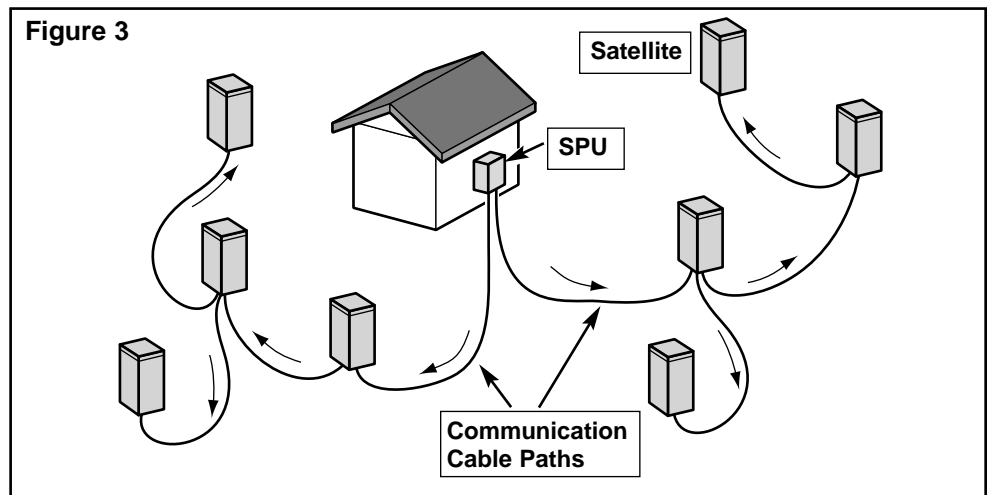
3. From the cable ends, carefully remove the outer jacket and inner insulation to expose 3' (0.9m) of comm and drain wire. Remove 3/8" (10mm) insulation from the ends of each comm wire and cut the drain wires off at 2" (51mm).

4. Secure the comm cables and drain wires to the surge bracket assembly as shown in **Figure 4**.

5. Route the twisted-pair comm wires up and over the chassis plate assembly to the modem.

6. Attach the yellow comm wire(s) to the modem connector plug terminal #1, and the gray comm wire(s) to terminal #2. See **Figure 5**.

Note: Leave the modem connector plug disconnected until the comm cable has been tested. Refer to the installation instructions provided with the central controller for cable testing procedures.



Connecting Field Wiring

1. Attach the control and common wires to the valves and/or valve-in-head solenoid leads using an approved waterproof splicing method. Label each control wire to enable identification at the controller installation site. Route wires into the controller cabinet through the 3" (76mm) conduit.

Caution: Connecting more than three solenoid loads per station is not recommended. Output per station is 0.75A (maximum current draw must not exceeded 3.2A). If the valve current rating is unknown, contact your Toro distributor for assistance prior to making this type of connection.

- If automatic pump start is required, refer to the applicable wiring diagram in **Figure 6** and install accordingly.
- Referring to **Figure 7**, secure the valve control wires to valve station terminals 1 – 32 in the preferred operating sequence.
- Secure the field common wire(s) to the COM terminal(s) and the pump relay to the PUMP terminal

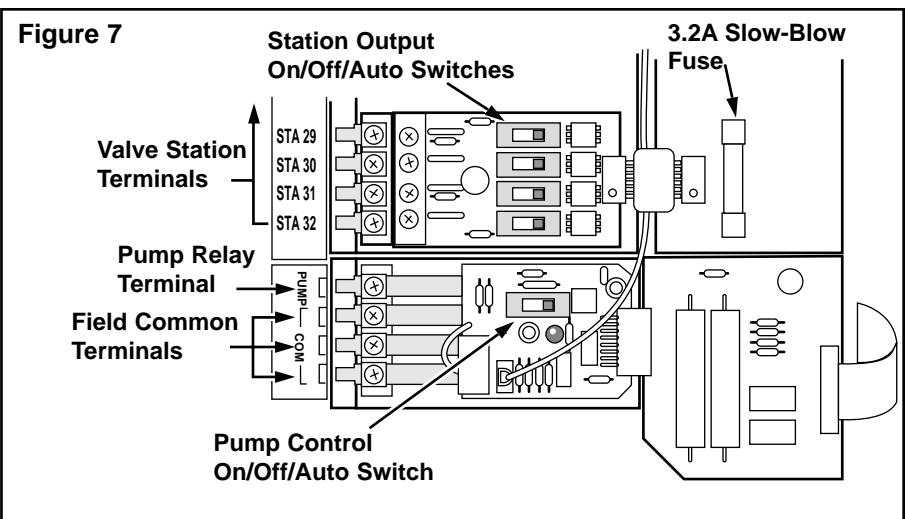
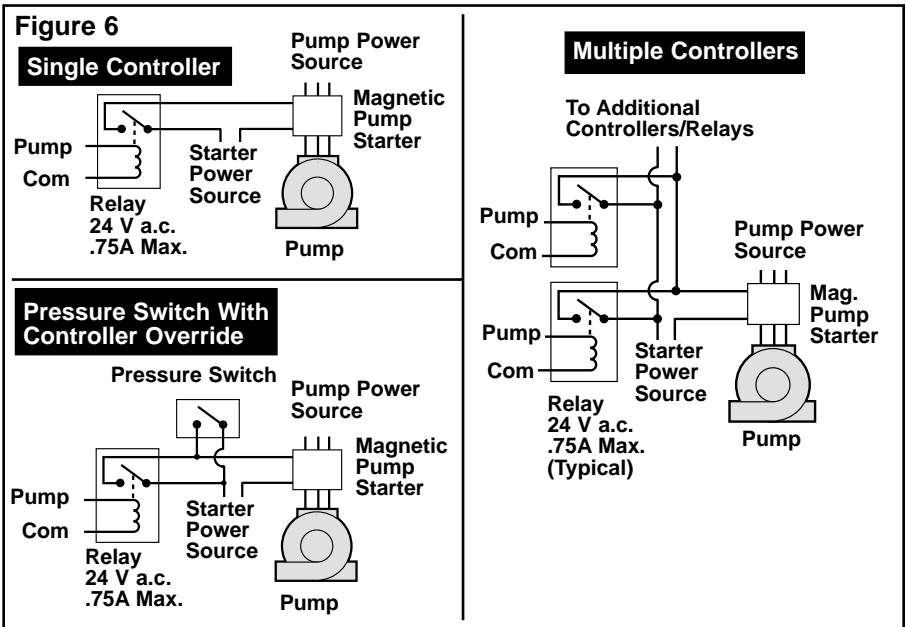
Note: A 3-position control switch is provided for each 24V output. See **Figure 7**. The three switch positions control the circuits as follows:

On – Manually activates the circuit. The pump or station will remain on until the switch is moved to the Auto or Off position.

Off – Switches the circuit off, preventing pump or station operation from the satellite.

Auto – The circuit is automatically activated by the controller during automatic or manual watering operation.

Caution: A 3.2A slow-blow fuse is provided for each 4-station output surge control assembly and in the power supply assembly to provide protection from excessive output current draw. When using the station control switches to manually activate multiple stations, do not exceed a 3.2A load – fuse damage will result.



WARNING



IF FUSE REPLACEMENT IS REQUIRED, REPLACE ONLY WITH THE SAME TYPE AND AMPERAGE RATING. INSTALLATION OF A HIGHER AMPERAGE RATED FUSE CAN RESULT IN SERIOUS INJURY AND/OR EQUIPMENT DAMAGE DUE TO FIRE HAZARD.

WARNING



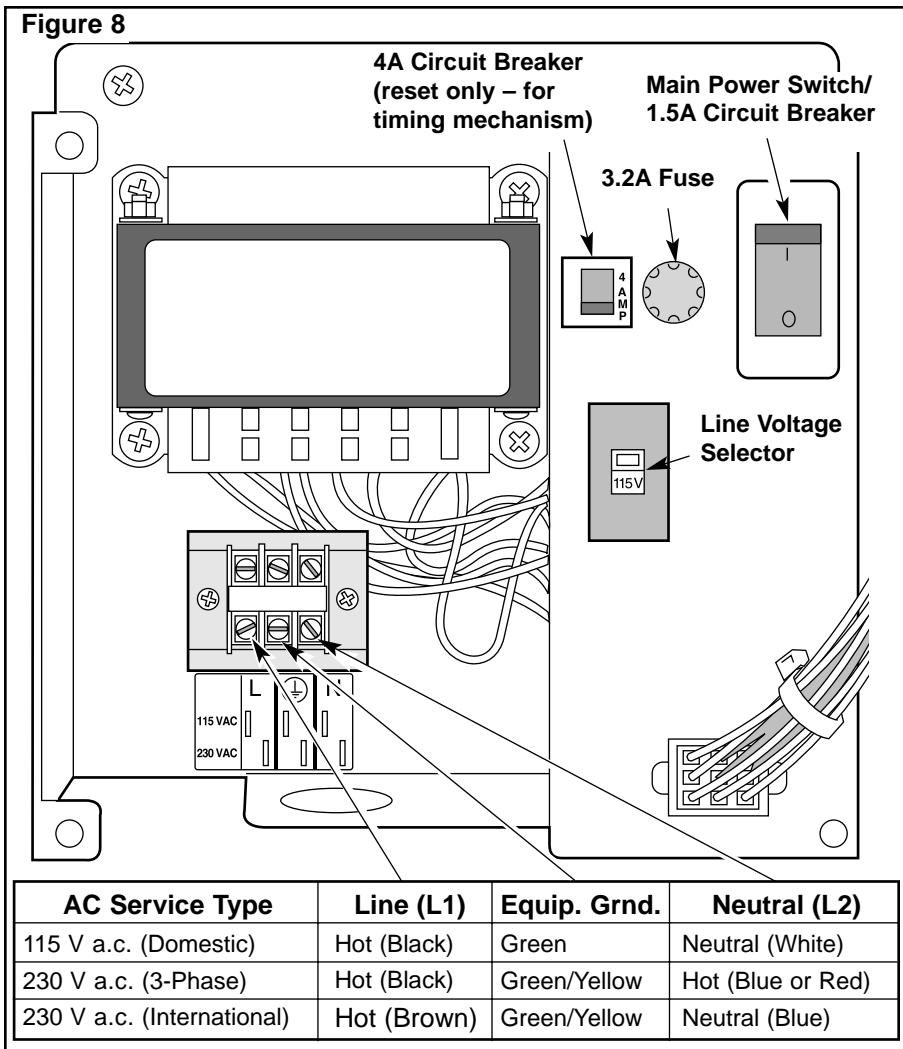
AC POWER WIRING MUST BE INSTALLED AND CONNECTED BY QUALIFIED PERSONNEL ONLY.
ALL ELECTRICAL COMPONENTS AND INSTALLATION PROCEDURES MUST COMPLY WITH ALL APPLICABLE LOCAL AND NATIONAL ELECTRICAL CODES. SOME CODES MAY REQUIRE A MEANS OF DISCONNECTION FROM THE AC POWER SOURCE, INSTALLED IN THE FIXED WIRING, HAVING A CONTACT SEPARATION OF AT LEAST 0.120" (3MM) IN THE LINE AND NEUTRAL POLES.
ENSURE THE AC POWER SOURCE IS OFF PRIOR TO CONNECTING THE CONTROLLER.

Input Power Installation

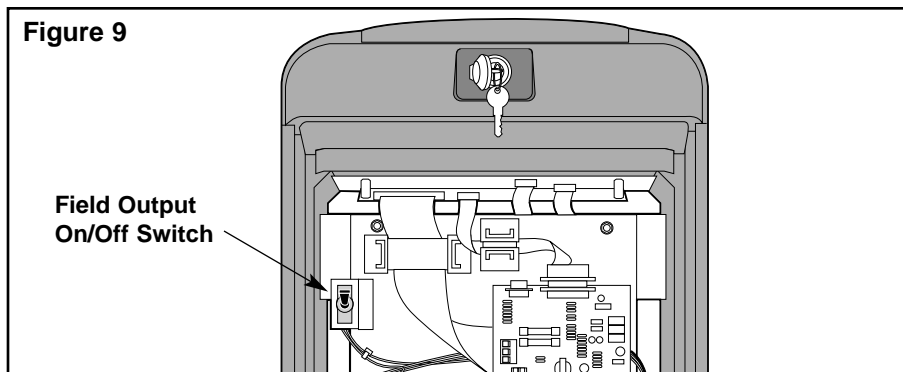
Caution: When installing multiple controllers, polarity of the Line(s) and Neutral connections must be properly maintained throughout the irrigation system. Reversed polarity may cause damaging potentials to exist at one or more controller locations.

Procedure

1. Place the controller's main power switch in the Off position. See **Figure 8**.
2. Using a small blade screwdriver, position the line voltage selector switch to indicate 115V or 230V as required.
3. Remove the power supply assembly cover (secured with four phillips screws).
4. Optional – Install a section of flexible 3/4" (19mm) electrical conduit from the foundation conduit to the opening provided in the bottom of the power supply housing.
5. Route the appropriate size 3-conductor power cable from the power source location into the power supply assembly.
6. Attach the wires to the terminal block as indicated by the chart in **Figure 8**.
7. Install the power supply cover and secure with four phillips screws.



Note: An On/Off switch, located as shown in **Figure 9**, is provided for the control of the 24 V a.c. field output. When switched to the Off position, all output to the field will be prevented.



Specifications

Line Voltage: 115/230 V a.c. 50/60 Hz (switchable), 130 VA (100W)

Current Draw (no load): 0.41A @ 115V, 60 Hz, 0.21A @ 230V, 50 Hz

Current Draw (maximum load): 1.10A @ 115V, 60 Hz, 0.8A @ 230V, 50 Hz

Secondary Voltage Output: 24 V a.c., 50/60 H, 3.2A (77 VA)

Maximum Load Per Station Output: 0.75A (18 VA)

Maximum Load Per Pump/Master Valve Output: 0.75A (18 VA)

Hardware Features

Plastic Cabinetry

Front, Back and Top Locking Covers

Dimensions:

38-3/4" H x 16" W x 16"

(98.4cm H x 40.6cm W x 40.6cm D)

Electromagnetic Compatibility

Domestic: This equipment has been tested and found to comply with the limits for a FCC Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to the radio communications.

Operation in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

International: This is a CISPR 22 Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.